

The Journal of the
**INSTITUTE OF
METALS**

and
METALLURGICAL ABSTRACTS



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NOVEMBER 1950

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September 1948.

THE INSTITUTE OF METALS

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INSTITUTE NEWS AND ANNOUNCEMENTS

LIST OF MEMBERS

A new List of Members, corrected to 1 July 1948 so far as the Institute's records permit, will be distributed to all members, who are requested to use the special forms (bound in the list) for notifying all changes of particulars.

It is the Council's hope that the distribution of this list may enable members very largely to increase the Institute's membership during the current financial year. Most members will find, after studying the list, that they have qualified acquaintances in the fields of science and industry who should support the Institute's work and benefit from its publications and services. Invitations sent to such persons to apply for membership could result in a large accession of strength to the Institute.

Copies of forms of application will be found in many issues of the monthly *Journal*. The Secretary will be glad to supply additional copies on demand. Elections take place frequently.

ELECTION OF ORDINARY MEMBERS AND STUDENT MEMBERS

The following 18 Ordinary Members and 16 Student Members were elected on 16 August 1948 :

As Ordinary Members

BARON, Jean Jacques, Directeur des Services Techniques de l'Aluminium Français, 23 bis rue Balzac, Paris 8e, France.

BHATAWDEKAR, Raghunath Govind, B.A., B.Sc., B.Met., Metallurgist and Chemist, Central Standards Office, Ministry of Railways, New Delhi, India.

BOAS, Walter, Dr.-Ing., M.Sc., Principal Research Officer, Division of Tribophysics, Council for Scientific and Industrial Research, University of Melbourne, Victoria, Australia.

CARPENTER, Otis R., M.S., Engineer, Babcock and Wilcox Co., Barberton, Ohio, U.S.A.

NEWS AND ANNOUNCEMENTS

- CHIPPS, Charles Richard, Foundry Manager (Non-Ferrous), 18 Evelyn's Villas, Hillingdon, Middlesex.
- DALLAS, Hughes, Vice-President and General Manufacturing Manager, Revere Copper and Brass, Inc., 230 Park Avenue, New York, N.Y., U.S.A.
- DREBLOW, E. S., Controller of Production (Hilger Division), Hilger and Watts, Ltd., 97 St. Pancras Way, London, N.W.1.
- FELLOWS, John Albert, A.B., M.S., Sc.D., Assistant Chief Metallurgist, American Brake Shoe Co., Mahwah, N.J., U.S.A.
- HANSTOCK, Raymond Ford, Ph.D., Chief Physicist, High Duty Alloys, Ltd., Slough, Buckinghamshire.
- HARRIS, Herbert Roland, Technical Representative, Shaw and McInnes, Ltd., Beckville, Albion Rd., Chalfont St. Giles, Buckinghamshire.
- JACKSON, Frank, Chief Chemist and Technical Manager, Mansons, Ltd., Glasgow.
- LOEWY, Erwin, M.E., President, Hydropress, Inc., 570 Lexington Avenue, New York, U.S.A.
- RAO, Tanguturi Narasimha, Automobile Engineer, Cincinnati Milling and Grinding Machines, Inc., Cincinnati 9, Ohio, U.S.A.
- RIZK, Ahmed Mohammed (Bey), B.Sc., Chief Inspecting Engineer, Egyptian Government, 41 Tothill Street, London, S.W.1.
- SARANTIS, John S., B.A., Managing Director, Industrie Hellénique du Cuivre S.A. Resmadjoglou 14, Athens, Greece.
- WAINWRIGHT, Hector Aitken, M.Met., B.Eng., Director, Bir-metals, Ltd., Birmingham 32.
- WASILEWSKI, Roman Jerzy, B.A., Metallurgist, Murex, Ltd., Rainham, Essex.
- WILKINSON, John, Director and Chief Metallurgist, The Yorkshire Copper Works, Ltd., Leeds.

As Student Members

- ACKROYD, Dennis, Metallurgist, David Brown and Sons (Huddersfield), Ltd., Park Works, Lockwood, Huddersfield, Yorkshire.
- AINSWORTH, Patrick Arthur, Student of Metallurgy, Sheffield University.
- BURKE, James, Student of Metallurgy, University of Liverpool.
- CATTERALL, John Ashley, Student of Metallurgy, Royal School of Mines, South Kensington, London, S.W.7.
- DEMAIN, William, Student of Metallurgy, Royal School of Mines, South Kensington, London, S.W.7.
- DUNMORE, Owen J., Student of Metallurgy, Royal School of Mines, South Kensington, London, S.W.7.
- ENTWISLE, Anthony Roger, B.A., Student of Metallurgy, Cambridge University.
- EVANS, David John Ivor, Student of Metallurgy, Royal School of Mines, South Kensington, London, S.W.7.
- FARMERY, Harold Keith, Student of Metallurgy, Cambridge University.
- GRASSAM, Bryan William, B.A., Student, Cambridge University.
- HUGHES, James Ernest, Student of Metallurgy, Royal School of Mines, South Kensington, London, S.W.7.
- KILLINGTON, Albert James, Student of Metallurgy, Royal School of Mines, South Kensington, London, S.W.7.

NEWS AND ANNOUNCEMENTS

LITTLEWOOD, Geoffrey, Metallurgist, David Brown and Sons (Huddersfield), Ltd., Park Works, Lockwood, Huddersfield, Yorkshire.

PORTER, Frank Cecil, B.A., Student of Metallurgy, Cambridge University.

SLATE, Paul Martin Biers, Student of Metallurgy, Sheffield University.

YOUNG, Kenneth Owen, Junior Metallurgist, David Brown and Sons (Huddersfield), Ltd., Park Works, Lockwood, Huddersfield, Yorkshire.

PERSONAL NOTES

PROFESSOR LESLIE AITCHISON, D.Met., M.Sc., has been seriously ill and had an urgent operation.

DR. H. J. AXON, B.Met., has become engaged to be married to Miss Elisabeth Ellis.

MR. F. M. DAVIS, L.I.M., has joined the staff of Messrs. Swan, Hunter and Wigham Richardson, Ltd., Wallsend, as a Metallurgical Chemist.

MR. A. DUCKWORTH, B.Sc., has been appointed a Technical Officer (Metallurgist) in the Engineering Department of the Dyestuffs Division, Imperial Chemical Industries, Ltd., Manchester 9.

MR. S. K. GHASWALA, B.E., has been admitted to the membership of the following institutions: Institution of Engineers (India) (Associate Member); Société des Ingénieurs Civils de France (Member); International Association for Bridge and Structural Engineering (Zürich) (Member); International Association for Hydraulic Structures Research (Stockholm) (Member); and the British Interplanetary Society (Fellow). He has also been appointed a reviewer for *Applied Mechanics Reviews*.

DR. F. R. MORRIS, B.S., has been appointed Associate Professor of Materials Engineering at the College of Applied Science, Syracuse University, Syracuse, N.Y., U.S.A. For the past four years he has been Group Leader of the Metal Trades Laboratory of the Technical Service and Development Division, American Cyanamid Co., Stamford, Conn.

MR. M. C. NICKSON was recently awarded the M.Sc. degree of London University.

MR. W. D. ROBERTSON was awarded the degree of Doctor of Science of the Massachusetts Institute of Technology in June. He has since taken up a post on the staff of the Institute for the Study of Metals, at the University of Chicago, where he will study various aspects of surface chemistry pertaining to the corrosion of metals.

DR. H. MCK. SKELLY, B.Sc., is now engaged on metallurgical work in the research laboratories of the Aluminum Company of Canada, Ltd., Kingston, Ont. His private address is 145 Colborne St., Kingston, Ont., Canada.

NEWS AND ANNOUNCEMENTS

MR. O. THOMAS recently left the Imperial Smelting Corporation, Ltd., to take up an appointment as Assistant Manager with Treharne and Davies, Ltd., Analysts and Chemical Consultants, at their Swansea branch. His new private address is 2 Bath Rd., Morriston, Swansea, Glam.

MR. A. W. TOWN has left Cambridge University after having obtained First Class Honours in Metallurgy (Part II), and has been appointed to a post in the steel melting shop of Messrs. Hadfields, Ltd., Sheffield.

MR. D. W. WAKEMAN, B.Sc., has been awarded the degree of Ph.D. of Birmingham University.

MR. B. C. WOODFINE has been awarded the degree of B.Met. (Ferrous) with First Class Honours of Sheffield University, and, subsequently, the Robert Styring Postgraduate Research Scholarship in the University of Sheffield and also a D.S.I.R. grant to carry out two years' postgraduate research at the University.

DEATH

The Editor regrets to announce the death, in Edinburgh on 14 August 1948, of DR. WILLIAM CULLEN, who was elected a member of the Institute in 1929.

Note : Will members (in addition to informing the Institute's administrative departments of changes of address, occupation, &c.) kindly notify the Editor, separately, of all changes of occupation, appointments, awards of honours and degrees, &c., as these matters interest their fellow members. Such notes should reach the Editor not later than the 21st day of each month, for publication in the next month's issue of the *Journal*.

LOCAL SECTIONS NEWS

SESSION 1948-1949

Members are reminded that (free) membership of the Local Sections—Birmingham, London, Scottish, Sheffield, and South Wales—and the right of attendance at all meetings of the two Associated Societies—the Leeds Metallurgical Society and the Manchester Metallurgical Society—is a privilege of membership, but that, *at the commencement of each session*, it is necessary to notify the Honorary Secretary of the section or society that membership and the right of attendance are claimed.

The names and addresses of the Honorary Secretaries are :

Birmingham : Mr. E. H. Bucknall, M.Sc., F.I.M., 53 Hales-owen Rd., Quinton, Birmingham 32.

London : Dr. E. C. Rhodes, F.I.M., Development and Research Department, The Mond Nickel Co., Ltd., Bashley Rd., London, N.W.10.

Scottish : Mr. Matthew Hay, Craigton Industrial Estate, Barfillan Drive, Glasgow, S.W.2.

NEWS AND ANNOUNCEMENTS

Sheffield : Dr. W. R. Maddocks, B.Sc., Department of Applied Science, The University, Sheffield 1.

South Wales : Mr. K. M. Spring, 36 Beechwood Rd., Uplands, Swansea, Glam.

Leeds Metallurgical Society : Mr. W. J. G. Cosgrave, 24 Wellhouse Rd., Leeds 8.

Manchester Metallurgical Society : Mr. J. A. Tod, B.Sc., F.I.M., Imperial Chemical Industries, Ltd., Metals Division, Broughton Copper Works, Manchester.

Programmes of the Local Sections and of the Associated Societies are in course of completion, and will be distributed to members in the form of a folding card.

OTHER NEWS

JOINT COMMITTEE ON METALLURGICAL EDUCATION

Report on Progress for the period from 1st January 1947 to 30th June 1948

Nine meetings of the Committee were held during the period under review, including a Special Meeting held on 7 May 1948, to enable members to meet and interchange views with Dr. Robert F. Mehl of the Carnegie Institute of Technology, Pittsburgh, Chairman of the Advisory Committee on Metallurgical Education of the American Society for Metals.

The following is a list of members as at 30 June 1948, representing industry, the Iron and Steel Institute, the Institution of Mining and Metallurgy, the Institute of British Foundrymen, the Institute of Metals, the Institution of Metallurgists, Universities, the City and Guilds of London Institute, the Association of Technical Institutes, and the Association of Principals of Technical Institutes :

Professor Leslie Aitchison, D.Met., M.Sc. (*Chairman*).

Professor G. Wesley Austin, O.B.E., M.A., M.Sc.

Mr. G. L. Bailey, M.Sc.

Professor C. W. Dannatt, A.R.S.M., D.I.C.

Dr. C. H. Desch, F.R.S.

Mr. J. W. Gardom.

Dr. E. Gregory, M.Sc., Assoc.Met.

Mr. R. A. Hacking, O.B.E.

Dr. J. E. Hurst, J.P.

Mr. J. Sinclair Kerr.

Mr. E. J. Lawford.

Mr. E. D. McDermott.

Mr. W. A. C. Newman, O.B.E., B.Sc., A.R.S.M., A.R.C.S.

Mr. G. Patchin.

Dr. L. B. Pfeil, O.B.E., A.R.S.M.

Sir Arthur Smout, J.P.

Mr. R. B. Templeton.

Mr. D. R. O. Thomas.

Professor F. C. Thompson, D.Met., M.Sc.

Dr. A. M. Ward.

Mr. J. Wilson.

NEWS AND ANNOUNCEMENTS

Dr. C. H. Desch, while continuing his membership of the Committee, resigned the Chairmanship on 3 June 1947, and Professor Leslie Aitchison was appointed Chairman from that date.

During 1947 the Committee continued to give assistance to parents and students seeking information about facilities for metallurgical education, to compile information on metallurgical films, and to arrange for their loan to colleges, schools, local societies, and works.

A second and revised edition of the brochure "Metallurgy—A Scientific Career in Industry" has been prepared and was published in May 1948; it contains the latest available information about courses in metallurgy at Universities and Technical Colleges. Copies have been sent, among others, to all Local Education Authorities, the Principals of Technical Colleges, and Headmasters of Secondary Technical Schools. Over 6000 copies of this brochure have been distributed.

The work of the Committee includes :

(1) Consideration of the general requirements for providing education for metallurgists of all grades.

(2) Assisting in every way possible in the provision of the means by which these requirements can be secured at the different levels.

(3) Making known throughout the Secondary and Public Schools the opportunity offered by metallurgy as a career.

(4) Providing parents, guardians, careers masters, and others with full details of the educational facilities available to fit boys for various careers in metallurgy.

(5) Keeping continuous touch with industry in order to ascertain in what respects the young metallurgist is considered to fall short of the appropriate standard when he enters the metallurgical industry with : (a) a University degree ; (b) a National Certificate in Metallurgy or qualification of a similar standard ; (c) other qualifications from a Technical School or College. Ascertaining how far his falling short of the highest standard can be laid at the door of metallurgical education and taking such remedial steps as may be possible.

(6) Taking appropriate steps for carrying its policy into effect, including : (a) discussions and meetings with the interested people in industry, schools, technical colleges, universities, and Government departments, in order that views may be exchanged. (b) The preparation of memoranda addressed to the various bodies which may be concerned and the publication of the Committee's views and suggestions.

(7) The consideration of special matters of an important nature, such as entrance qualifications to University Schools of Metallurgy. A pamphlet giving the Committee's "Recommendations on Qualifications for Entrance to University Schools of Metallurgy" was published in April 1948 and widely circulated to the various interested bodies, and the recommendations have been published in the Press and in the Journals of the participating Institutes.

NEWS AND ANNOUNCEMENTS

INTER-SERVICE METALLURGICAL RESEARCH COUNCIL

The Admiralty and Ministry of Supply have set up an Inter-Service Metallurgical Research Council to advise them on metallurgical problems of importance to the Services. It will provide for the interchange of ideas on common metallurgical problems and avoid overlap between research programmes, and should also ensure that balance is maintained between fundamental and *ad hoc* research, and that the long-term research necessary for the provision of new alloys is embarked upon.

The Research Council includes representatives of the Admiralty and Ministry of Supply, and a number of distinguished metallurgists from the universities, industry, and other Governmental departments. The independent members are: Professor L. Aitchison, Professor of Industrial Metallurgy, University of Birmingham (Chairman); Professor E. N. da C. Andrade, Quain Professor of Physics, University College, London; Professor G. Wesley Austin, Goldsmiths' Professor of Metallurgy, Cambridge University; Mr. G. L. Bailey, Director, British Non-Ferrous Metals Research Association; Dr. R. W. Bailey, Research Consultant, Metropolitan-Vickers Electrical Co., Ltd.; Mr. H. H. Burton, Director of Research, English Steel Corporation, Ltd.; Dr. W. Hume-Rothery, Lecturer in Chemistry, Oxford University; Dr. H. Moore; Mr. A. J. Murphy, Research Director, J. Stone & Co., Ltd.; Mr. D. A. Oliver, Director of Research, B.S.A. Group; Dr. C. J. Smithells, Director of Research, The British Aluminium Co., Ltd.; Dr. C. Sykes, Director of Research, Firth-Brown Research Laboratories; Dr. W. H. J. Vernon, Chemical Research Laboratory, Teddington. The Secretary is Mr. A. H. Waterfield of the Ministry of Supply.

LIVERPOOL METALLURGICAL SOCIETY

The Society has published a very interesting programme for its first session, which commences on Thursday, 7 October 1948, when Professor J. H. Andrew, D.Sc., F.I.M., will lecture on "New Lamps for Old". The meeting will be held in the rooms of the Liverpool Engineering Society, 9 The Temple, 24 Dale St., Liverpool, at 7 p.m. A hearty invitation to attend this meeting is extended by the Society to all members of the Institute of Metals who can attend. Professor Andrew will present, in terms acceptable to an audience including chemists and engineers, some of the new concepts in metallurgy which are leading to fresh developments in this field.

Particulars of the Society may be obtained from the Honorary Secretary, Mr. C. W. J. Gellatley, 7 Woolacombe Road, Liverpool 16.

CONFERENCE ON THE FILM IN SCIENTIFIC RESEARCH

The Sciences Committee of the Scientific Film Association has arranged a one-day Conference on "The Film in Scientific Research", to be held on Tuesday, 12 October 1948, at The Royal Institution, London. The Chair will be taken by Mr. J. E. Cummins, Chief Scientific Liaison Officer in London of the Australian Government, and the Conference will be opened by Sir Robert Watson-Watt, C.B., F.R.S.

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The business of the Conference will be :

(i) Discussion by British and Foreign scientists as to the value of scientific films as a research tool in various branches of science : astronomy, biology, chemistry, physics, &c., during which suitable examples will be shown.

(ii) Discussion as to the function which the research film can play in giving up-to-date information to scientists working in a particular field.

(iii) Scientific films as an aid to the training of scientists.

(iv) Scientific films as a medium for explaining to the general public important results of scientific research.

(v) The technical aspects of the use of films in scientific research.

It is hoped that there will be time for a general discussion, when any points not previously mentioned can be raised. The Conference will conclude with a two-hour showing of British and foreign research films.

Material suggested for discussion and any information as to the existence or availability of any research films suitable for showing at the Conference, should be sent to the Hon. Secretary, Sciences Committee, Scientific Film Association, 34 Soho Square, London, W.1, as soon as possible; tickets and further information regarding the Conference can be obtained from the same address.

POLISH ENGINEERING SOCIETY

The Stowarzyszenie Techników Polskich w Wielkiej Brytanii (Association of Polish Engineers in Great Britain) has changed its Bye-laws to conform to the Companies Acts, 1929 and 1947, and has been incorporated as the "Institution of Polish Engineers in Great Britain".

The new Institution will conform to the pattern of similar British institutions. It has more than 600 members, who are divided into various professional "sections". The headquarters of the Society is at 146 Holland Road, London, W.14.

AUSTRALIAN JOURNAL OF SCIENTIFIC RESEARCH

The Council for Scientific and Industrial Research, in collaboration with the Australian National Research Council, has decided to take responsibility for the establishment in Australia of a new scientific journal, the *Australian Journal of Scientific Research*, as a medium for the publication of research papers of outstanding merit. This journal is open to receive contributions from research workers, irrespective of country or of the organization to which they are attached.

Dr. N. S. Noble has been appointed as Editor of the new journal. Editorial policy will be determined by an Editorial Board under the chairmanship of the Editor and comprising as members: Professor W. J. Dakin (Department of Zoology, University of Sydney), Professor E. J. Hartung (Department of Chemistry, University of Melbourne), Professor L. H. Martin (Department of Physics, University of Melbourne), and Professor J. G. Wood (Department of Botany, University of Adelaide). The Board aims to achieve a high standard of quality in papers accepted, and a strict refereeing system has been instituted.

NEWS AND ANNOUNCEMENTS

The journal will be printed in two series: Series A (Physical Sciences) and Series B (Biological Sciences). Initially, each series will be issued quarterly and will cost 30s. per annum.

THE DESIGN AND OPERATION OF FUEL-FIRED FURNACES, WITH SPECIAL REFERENCE TO RECENT DEVELOPMENTS

A course of 20 lectures on this subject will be delivered in the Department of Applied Chemistry (Head: Dr. J. E. Garside), Northampton Polytechnic, St. John St., London, E.C.1, on Tuesday evenings at 7 p.m., commencing on 5 October 1948. The fee for the course is 21s.; admission to the course is effected by personal enrolment at the office of the Polytechnic on any weekday between 10 a.m. and 7 p.m.

TECHNOLOGY OF REFRACTORY MATERIALS

A course of ten lectures on this subject by Mr. L. R. Barrett, B.A., B.Sc., M.S., will be delivered in the Department of Applied Chemistry (Head: Dr. J. E. Garside), Northampton Polytechnic, St. John St., London, E.C.1, on Wednesday evenings at 7 p.m., commencing on 6 October 1948. The fee for the course is 12s. 6d.; admission to the course is by personal enrolment at the office of the Polytechnic on any weekday between 10 a.m. and 7 p.m.

DIARY FOR OCTOBER

LOCAL SECTIONS MEETINGS

Birmingham Local Section.—Open discussion on Controlled Atmospheres; opening speakers, Mr. P. F. Hancock, B.A., F.I.M., and Mr. W. B. Morrison, F.I.M. (Sir James Watt Memorial Institute, Great Charles St., Birmingham, Thursday, 7 October, at 6.30 p.m.)

London Local Section.—Chairman's lecture, by Mr. W. F. Randall, B.Sc., A.R.S.M., M.I.E.E., F.I.M.: "Alloys of Special Physical Characteristics Used for Instrument Manufacture". (4 Grosvenor Gardens, London, S.W.1, Thursday, 7 October, at 7 p.m.)

Scottish.—Mr. D. S. Burwood: "Technique of Extraction Processes". (Institution of Engineers and Shipbuilders in Scotland, 39 Elmbank Crescent, Glasgow, C2, Monday, 11 October, at 6.30 p.m.)

South Wales.—Chairman's Address, by Mr. D. W. Hopkins, B.Sc. (Royal Institution, Victoria Rd., Swansea, Tuesday, 12 October, at 6.30 p.m.)

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OTHER MEETINGS

THURSDAY, 7 OCTOBER

Leeds Metallurgical Society.—Mr. G. A. Jones: "High-Speed Photography". (Chemistry Department, The University, Leeds, at 7.30 p.m.)

Liverpool Metallurgical Society.—Professor J. H. Andrew: "New Lamps for Old". (Rooms of Liverpool Engineering Society, 9 The Temple, 24 Dale St., Liverpool, at 7 p.m.)

TUESDAY, 12 OCTOBER

Egypt Exploration Society.—Professor V. G. Childe: "Metallurgy in the Ancient East". (4 Chesterfield Gardens, London, W.1, at 8 p.m.)

Institution of Mechanical Engineers, Automobile Division.—Annual General Meeting; Induction of New Chairman; Chairman's Address. (The Institution, Storey's Gate, London, S.W.1, at 6 p.m.)

WEDNESDAY, 20 OCTOBER

Manchester Metallurgical Society.—Presidential Address by Mr. A. H. Goodger, M.Sc., A.R.I.C. (Engineers' Club, Albert Sq., Manchester, at 6.30 p.m.)

APPOINTMENTS VACANT

To conform to the requirements of the Control of Engagements Order, 1947, these advertisements are published for the information only of those who are "excepted persons" under the Order.

CHIEF INSPECTOR, to take charge of existing inspection organization. Knowledge of aluminium alloys, brass, and copper essential, and experience of A.I.D. methods and procedure preferred. Write fully to Secretary, James Booth & Company, Limited, Argyle Street, Birmingham 7.

METALLURGIST, or Mineralogist, required for laboratory controlling and developing manufacturing process using metals (mainly non-ferrous) and minerals. The works are on the N.E. Coast. A university degree in metallurgy or natural science is essential, and some experience of scientific control or research in industry is desirable. Age 25-35. Write giving details of training, experience, and salary to Box No. 241, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

TECHNICAL MANAGER required for important zinc oxide factory in the Midlands. Necessary qualifications include preferably actual experience of this manufacture, or suitable academic qualifications together with considerable metallurgical smelting works experience. Manager would also be required to have or acquire, full knowledge of technique of paint and rubber applications of oxide and be able to organize the necessary research into these aspects. This is not an advertisement for a laboratory man, but for a very experienced metallurgist or metallurgical engineer of the highest grade who can hold a highly responsible senior managerial position, and for whom the post is consequently one carrying an exceptional remuneration. Fullst typed details please to Box No. 242, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

THE CIVIL SERVICE COMMISSIONERS invite applications for a permanent post as **PRINCIPAL SCIENTIFIC OFFICER** or **SENIOR SCIENTIFIC OFFICER** in the Ministry of Supply Headquarters in London. Candidates must have been born on or before 1 August 1917, and must possess a First or Second Class Honours degree in Metallurgy. Experience in the metallography of light alloys is required. Inclusive salary scales: Principal Scientific Officer, £900-£1220 (men); Senior Scientific Officer, £650-£850 (men); rates for women are somewhat lower. Further particulars and application forms from the Secretary, Civil Service Commission, Scientific Branch, 27 Grosvenor Square, London, W.1, quoting No. 2279. Completed application forms must be returned by 8 October 1948.

YOUNG METALLURGIST with degree, preferably with some knowledge and experience of welding, required for development work on welding of light alloys in North-West Area. Knowledge of chemistry up to Pass Degree standard desirable. Position requires initiative and ability. Apply stating age, qualifications, and experience to Box H.4489, W. H. Smith & Son, Ltd., Manchester 3.

October 1948.

THE INSTITUTE OF METALS

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Sir ARTHUR SMOUT, J.P.

Secretary and Editor of Publications :

Lieut.-Colonel S. C. GUILLAN, T.D.

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INSTITUTE NEWS AND ANNOUNCEMENTS

HONORARY MEMBER OF COUNCIL

Captain (E) F. A. LISTER, R.N., has been nominated by the Lords Commissioners of the Admiralty to be their representative, as an Honorary Member of Council of the Institute, in place of Captain (E) J. G. C. GIVEN, C.B.E., R.N.

AUTUMN MEETING IN CAMBRIDGE

A very successful Autumn Meeting was held in Cambridge from Tuesday, 14 September to Friday, 17 September, inclusive; it was attended by about 250 members and friends. A particularly pleasing feature of the meeting was the attendance of members and delegates from overseas, who included: Dr. W. Boas (Australia); Mr. W. A. Cartwright (Australia); Mr. O. G. Edwards (Australia); Dr. F. C. Frary (U.S.A.); Dr. H. Lepp (France); Professor G. Letendre (Canada); Dr. N. W. F. Phillips (Canada); Mr. R. H. Rimmer (Canada); Mr. Irving Rossi (U.S.A.); Dr. and Mrs. George Sachs (U.S.A.); Mr. H. Schofield (India); Dr. and Mrs. C. S. Smith (U.S.A.); M. R. Sourdais (France); Professor R. E. de Strycker (Belgium); M. M. Tournaire (France); M. J.-R. Tschudnowsky (France); Professor, Frau, and Fraulein von Zeerleder (Switzerland); and the following delegates of the Association Technique de la Première Transformation de l'Acier et des Métaux Non-Ferreux, Paris: M. J. Bonnet (Member) (Chef du Service de Documentation); M. Dutacq (Chef de la Branche Métaux Non-Ferreux); Dr. Héréguel (Directeur du Centre de Recherches de la Société des Trefileries et Laminiers du Havre); M. Raymond Paris (Directeur des Usines de Navarre à Evreux); M. J. M. Pouvreau (Member) (Chef du Laboratoire de Recherches de la Compagnie Française des Métaux); Dr. Georges Renouard (Association).

The meeting opened at 6.30 p.m. on Tuesday, 14 September, with a Service in the Church of St. Edward, King and Martyr, when the Vice-Chancellor of the University (The Rev. Professor C. E. Raven, D.D.) preached a memorable sermon, and welcomed members on behalf of the University. After the service, members and guests attended a conversazione in the Old Schools, where, in

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the oldest rooms of the University, there was an exhibition of scientific instruments and scientific and technical books.

At the first technical session on the morning of Wednesday, 15 September, the Mayor of Cambridge welcomed the members to the town. On the mornings of 15 and 16 September very interesting discussions were held on papers that have been printed in the *Journal* (for details see pp. 108 and 109 of the July issue), while in the afternoons visits were paid locally to laboratories and works of interest. In the evening of Wednesday there was a dance at the Guildhall, which was attended by the Mayor and Mayoress of Cambridge.

On Thursday evening Professor Sir Lawrence Bragg delivered, with the simplicity and charm for which he is renowned, the Autumn Lecture on "The Cavendish Laboratory", when he spoke on the organization of the Laboratory and on some of the work in progress. The lecture will be printed in the *Journal* in due course. After the lecture, the President entertained members and delegates from overseas at a dinner party at the University Arms Hotel. Professor J. Chipman of the Massachusetts Institute of Technology, who had arrived in Cambridge that day, was also present.

Friday was spent in visits to metallurgical or engineering works at Corby, Bedford, and Ipswich, when the Directors of the works visited kindly entertained members to lunch and tea. Another party of members and ladies paid an all-day visit to Peterborough and Ely Cathedrals.

LIST OF MEMBERS

The first List of Members published by the Institute since 1938 was distributed to all members with the September 1948 issue of the monthly *Journal*. The list is corrected to 1 July; unavoidable delays in printing have held up its distribution.

So that the list may be kept up to date, will members please notify the Secretary now, and in future, of all changes in title, honours, degrees (with University), position, firm, and address to which it is desired that communications should be sent. A form for this purpose will be found facing the inside front cover of the list.

Supplements to this list, in the form of lists of members elected, will be found in the September 1948 and subsequent issues of the *Journal*.

ELECTION OF ORDINARY MEMBERS, ASSOCIATE MEMBER, AND STUDENT MEMBERS

The following 26 Ordinary Members, 1 Associate Member, and 11 Student Members were elected on 1 October 1948:

As Ordinary Members

BISHOP, Brian James, Assistant, The Brass and Copper Tube Association, King Edward House, New Street, Birmingham 2.
BONSACK, Walter, Director of Laboratories, Apex Smelting Company, 6700 Grant Avenue, Cleveland 5, O., U.S.A.

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- DE BROUCKÈRE, Professor Lucia C. F., Dr. ès Sci., Professor of Chemistry, Faculté de Science, Université Libre de Bruxelles, 50 avenue F. D. Roosevelt, Bruxelles, Belgium.
- CARTWRIGHT, William Albert, Electrical Engineer, Austral Bronze Company Pty., Ltd., O'Riordan Street, Alexandria, N.S.W., Australia.
- CHENG, C. F., S.B., Resident Metallurgical Engineer, International Nickel Company, Inc., c/o I.C.I. (China), Ltd., 133 Szechuan Road, Shanghai, China.
- DURRANT, Archibald William, D.S.O., Company Secretary, Rhokana Corporation, Ltd., 11 Old Jewry, London, E.C.2.
- EDWARDS, Owen Graham, Production Superintendent, Austral Bronze Company Pty., Ltd., Alexandria, N.S.W., Australia.
- FISHWICK, Stanley James, Metallurgist, Thomas Chatwin and Co., Great Tindal Street, Birmingham 16.
- FUIDGE, Guy Hamilton, B.Sc., Chief Physicist, South Metropolitan Gas Company, 709 Old Kent Road, London, S.E.15.
- GOODWIN, Edward Charles, Heat-Treatment Superintendent, Armstrong Whitworth and Company (PT), Ltd., Close Works, Gateshead-on-Tyne, Co. Durham.
- HOOVER, William Henry Lewis, B.Sc., Research Technical Officer (Metallurgist), Imperial Chemical Industries, Ltd., Metals Division, Witton, Birmingham 6.
- LE BAILLY, Lieut.-Commander (E) Louis Edward Stewart Holland, R.N., Engineer Officer, Royal Navy, Sharpham Park, Walton, near Street, Somerset.
- LINDSAY, Noel Ker, B.A., B.C.L., Director, British Non-Ferrous Metals Federation, 132 Hagley Road, Birmingham.
- McCLOUD, John Lansford, B.Ch.E., Director of Chemical Engineering and Chemical and Metallurgical Research, Ford Motor Company, Dearborn, Mich., U.S.A.
- MARVIN, Philip Roger, B.S., Director of Research and Development Engineering, Milwaukee Gas Specialty Company, 722 North Jackson Street, P.O. Box 461, Milwaukee 1, Wis., U.S.A.
- MASSY-GREENE, John Brian, B.A., Manager, Austral Bronze Company Pty., Ltd., Derwent Park Factory, Glenorchy, Hobart, Tasmania, Australia.
- MOLINEUX, Arthur Leslie, Assistant Managing Director, Winfields Rolling Mills, Ltd., Icknield Port Road, Birmingham 16.
- REESE, John H., B.S., Technical Advisor, Revere Copper and Brass, Inc., Dallas Division, 2200 North Natchez Avenue, Chicago 35, Ill., U.S.A.
- ROTHERHAM, Leonard, M.Sc., Head, Metallurgical Department, Royal Aircraft Establishment, Farnborough, Hampshire.
- RYDER, Percy, Works Manager, Charles Clifford and Son, Ltd., Birmingham 5.
- SAHA, G. M., B.Sc., Chemist and Metallurgist, Ordnance Factory Laboratory, P.O. Muradnagar, Dist. Meerut, India.
- SCHLOEN, John Henry, Chemical Engineer; Metallurgist, Canadian Copper Refiners, Ltd., P.O. Box 489, Place d'Armes, Montreal 1, Que., Canada.
- SMITH, Peter Drury, B.Sc., Engineer, The Laurels, The Ridge, Redlynch, Salisbury.
- THEXTON, John, A.Met., Research Metallurgist, Research and Development Department, The Mond Nickel Company, Ltd., Wiggin Street, Birmingham.

NEWS AND ANNOUNCEMENTS

TURNER, William Arthur, Partner, W. A. Turner, Jeffrey, and Company, Foundry Consultants, 44 London Road, Royston, Herts.

WALDEN, William, Works Manager, John Wilkes, Sons, and Mapplebeck, Ltd., Abberley Street, Winson Green, Birmingham 18.

As Associate Member

RICHARDS, John Taylor, B.S., Sales Engineer, The Beryllium Corporation, Reading, Pa., U.S.A.

As Student Members

BAILEY, Francis Walter John, B.Sc., Research Metallurgist, Research and Development Department, The Mond Nickel Co., Ltd., Wiggin Street, Birmingham 16.

BULLOCK, William John, Assistant Experimental Officer, A.E.D., Admiralty; attached to Metallurgical Laboratory, M.E.D., H.M. Dockyard, Devonport.

DAVIES, Dennis, Metallurgical Assistant, The Mint, Birmingham, Ltd., Birmingham.

ENTWISTLE, Kenneth M., M.Sc., Ph.D., Assistant Lecturer, Department of Metallurgy, The University, Manchester.

FARTHING, Thomas William, B.A., Student of Metallurgy, Cambridge University.

GALLACHER, William, Metallurgical Chemist, 1 Adamson Street, Massend, Bellshills, Lanarkshire.

HARGREAVES, Maxwell Edgar, B.Met.E., Research Officer, Division of Tribophysics, Council for Scientific and Industrial Research, Australia; attached Cavendish Laboratory, Cambridge.

HEATON, William George, B.Sc., Research Metallurgist, Imperial Chemical Industries, Ltd., Metals Division, Witton, Birmingham.

JONES, Richard Maxwell, B.A., lately Student of Metallurgy, Cambridge University.

MELINCK, Gerald Montague, Assistant Chemist, Research Department, Alumilite and Alzak, Ltd., Brentwood Road, London, N.W.10.

SKINNER, Richard Anthony, B.Sc., Student, 51 Kingswood Road, Tadworth, Surrey.

PERSONAL NOTES

MR. C. P. BERNHOEFT, Dipl. Ing., has been elected a Fellow of the Institution of Metallurgists.

MR. DONALD J. BLICKWEDE has been awarded the degree of Doctor of Science by the Massachusetts Institute of Technology. He is now in charge of high temperature alloy research at the Naval Research Laboratory, Washington, D.C., U.S.A.

DR. P. BRENNER returned to Germany in September.

DR. B. CHALMERS has resigned from the Atomic Energy Research Establishment to take up the post of Professor of Physical Metallurgy at the University of Toronto. Professor Chalmers's new address is Department of Metallurgical Engineering, University of Toronto, Toronto 5, Ont., Canada. He left England for Canada in September.

NEWS AND ANNOUNCEMENTS

DR. J. C. CHASTON, B.Sc., A.R.S.M., has been elected a Fellow of the Institution of Metallurgists.

MR. ARTHUR CROSBY has taken up an appointment as Metallurgist to Frigidaire, Ltd., 401 Edgware Rd., The Hyde, London, N.W.9.

MR. FRANK W. DALE, B.Sc., has been appointed to the position of Divisional Chemist with the Merseyside and North Wales Division of the British Electrical Authority, Clarke's Gardens, Woolton, Liverpool.

MR. D. R. G. DAVIES, B.Sc., has resigned his position as Chief Metallurgist to the Panteg Branch of Richard Thomas and Baldwins, Ltd., and is taking up his studies, on the award of a Mond Nickel Fellowship, in London and in America.

MR. R. B. DEELEY, B.Sc., A.R.S.M., has recently been appointed a Director of Light Alloys, Ltd., London.

DR. A. G. DOWSON, M.A., has been elected a Fellow of the Institution of Metallurgists.

MR. E. A. FISHWICK, A.R.S.M., has been elected a Fellow of the Institution of Metallurgists.

MR. N. N. GHOSH, B.Sc., B.Met., has been elected a Fellow of the Institution of Metallurgists.

MR. M. K. HALDAR, M.Sc., has left his appointment as Metallurgical Chemist in the National Pipes and Tubes Co., Ltd., Sharnagar, West Bengal, and is now employed by the Textile Machinery Corporation, Ltd., as Research Officer, to organize their Research Department.

MR. A. R. HARDING has been awarded the B.Sc. degree, with Honours in Physical and Theoretical Metallurgy, of the University of Birmingham.

MR. JOHN W. HAYWOOD has been awarded the degree of Bachelor of Arts, with Second Class Honours in Metallurgy, of Cambridge University, and has taken up an appointment as Works Metallurgist with the National Smelting Co., Ltd., Avonmouth.

MR. T. J. HIRST, B.Sc., has been appointed as Shift Manager at the Appleby Melting Shop of the Appleby-Frodingham Steel Co.

MR. F. H. HOULT has been appointed General Manager of the Light Castings Department of Newton Chambers and Co., Ltd., Sheffield, in succession to Mr. W. A. Curran, who has resigned this position to take up foundry engineering consulting work.

MR. J. C. W. HUMFREY, O.B.E., B.A., M.Sc., M.Eng., has been elected a Fellow of the Institution of Metallurgists.

DR. L. B. HUNT, M.Sc., A.R.C.S., has been elected a Fellow of the Royal Institute of Chemistry.

MR. K. J. IRVINE, B.Sc., has been awarded the Ph.D. degree of the University of Leeds.

MR. T. L. JOHNSTON has graduated with the degree of B.Eng. (First Class Honours in Metallurgy) of the University of Liverpool, and will remain at the University to carry out a Ph.D. course.

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MR. H. D. JONES has left King's College, Newcastle-on-Tyne, and is now at the Central Research Department, Dorman, Long and Co., Ltd., Middlesbrough.

MR. L. KENWORTHY, M.Sc., A.R.C.S., has been elected a Fellow of the Institution of Metallurgists.

MR. H. J. KOZLOWSKI, B.Sc., returns to Canada this month to resume work at the Physical Metallurgy Laboratories, Bureau of Mines, Ottawa, on completion of post-graduate research at the Industrial Metallurgy Department of the University of Birmingham.

MR. G. D. MCADAM, B.Sc., has recently been awarded the degree of Doctor of Philosophy of the University of Sheffield, and also the Brunton Medal for metallurgical research.

MR. ROBERT MADDIN has been awarded the degree of Doctor of Engineering of Yale University, and has been appointed a Research Fellow in Metallurgy at Yale.

MR. H. G. MASLIN has been awarded the B.Sc. degree (Second Class Honours in Metallurgy) of the University of London, and also the Associateship of the Royal School of Mines. He will leave this country to take up a post with the Southern Rhodesian Civil Service.

MR. M. MILNE, B.Sc., has joined the Crawley Development Corporation as Senior Engineer in the Chief Engineer's Department, Broadfield, Crawley, Sussex.

MR. G. L. MORETON has been elected an Associate of the Institution of Metallurgists.

MR. F. R. NELSON, B.Sc., has left Armstrong Siddeley Motors, Ltd., to take up an appointment with Humber, Ltd., Humber Road Works, Coventry. He has also changed his address to c/o Mrs. Clay, 8 Stubbs Grove, Wyken, Coventry.

MR. H. NEUFELD has been awarded, as an external student, the degree of Bachelor of Science of London University. Mr. Neufeld holds a post at the Research Laboratories of The British Aluminium Co., Ltd., Gerrards Cross.

MR. M. C. NICKSON has been awarded the M.Sc. degree of London University.

MR. P. I. PARRY has obtained the degree of B.Eng. (First Class Honours in Metallurgy) of Liverpool University, and is now a Graduate Apprentice with the English Electric Co., Ltd., Rugby.

MR. A. L. PENDREY, B.Sc., has accepted an appointment with John Dale, Ltd., London Colney, Herts.

MR. A. PREECE, M.Sc., F.I.M., has been appointed Professor of Metallurgy at Durham University.

DR. ROBERT J. RAUDEBAUGH has joined the Faculty of Georgia Institute of Technology as Professor of Metallurgical Engineering and as a Research Metallurgist in the Georgia Tech. Engineering Experiment Station.

MR. JAMES B. RUSSELL, B.S., recently joined the staff of the Research Department of the Permanente Metals Corporation, Spokane, Wash., U.S.A., as Physical Metallurgist.

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MR. G. SHAW SCOTT, M.Sc., has been elected President of the London Branch of the Birmingham University Guild of Undergraduates.

MR. W. M. SERVICE, B.Sc., A.R.S.M., has joined the Board of Mechans, Ltd., Glasgow, as Technical Director.

MR. EDWIN TAYLOR has obtained the B.Sc. (Engineering) Metallurgy degree, with Second Class Honours, of the University of London.

MR. F. M. THOMAS has graduated with the degree of B.Sc. (2A Class Honours in Metallurgy) of the University of Wales, and has taken up an appointment with the Appleby-Frodingham Steel Co., Scunthorpe, Lincs.

MR. D. W. WAKEMAN, B.Sc., has been awarded the Ph.D. degree of Birmingham University.

MR. W. J. WILLIAMS, A.I.M., has been awarded the M.Sc. degree of the University of Wales.

DEATH

The Editor regrets to announce the death on 16 August 1948, while on holiday on the Norfolk Broads, of MR. THOMAS MACDONALD ROBERTSON, B.Sc.

Note : Will members (in addition to informing the Institute's administrative departments of changes of address, occupation, &c.) kindly notify the Editor, separately, of all changes of occupation, appointments, awards of honours and degrees, &c., as these matters interest their fellow members. Such notes should reach the Editor not later than the 21st day of each month, for publication in the next month's issue of the *Journal*.

JOINT ACTIVITIES

JOINT COMMITTEE FOR NATIONAL CERTIFICATES IN METALLURGY

Report on the Progress of the Scheme for the Award of National Certificates in Metallurgy for the year 1947-48

During the year 1947-48 the Institution of Metallurgists joined the Iron and Steel Institute, the Institution of Mining and Metallurgy, and the Institute of Metals in co-operating with the Ministry of Education in the operation of the scheme for National Certificates in Metallurgy in England and Wales.

Schemes have been approved by the Joint Committee and have

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been in operation during 1947-48 at the following Technical Colleges :

(a) Senior Courses leading to an Ordinary National Certificate in Metallurgy :

Battersea Polytechnic, London.
Birmingham Central Technical College.
Chesterfield Technical College.
Coventry Technical College.
Cumberland Technical College, Workington.
Derby Technical College.
Dudley and Staffordshire Technical College. (Scheme is supplementary to that of County Technical College, Wednesbury.)
Enfield Technical College.
Ilkeston Technical Evening Institute.
Merchant Venturers' Technical College, Bristol.
Newport Technical College.
Rotherham College of Technology.
Scunthorpe Technical College.
Smethwick, The Chance Technical College.
Swansea Technical College.
Wednesbury, County Technical College.
Wolverhampton and Staffordshire Technical College.

(b) Advanced Courses leading to a Higher National Certificate in Metallurgy :

Battersea Polytechnic, London.
Birmingham Central Technical College.
Chesterfield Technical College.
Middlesbrough, Constantine Technical College.
Rugby College of Technology.
Rutherford College of Technology.
Wednesbury, County Technical College.
Wolverhampton and Staffordshire Technical College.

Final Examinations were held in 1948 at the following Technical Colleges for Students who satisfied the conditions laid down in Ministry of Education Rules III, under which the Scheme is operated :

(a) Ordinary Certificate :

Battersea Polytechnic, London.
Birmingham Central Technical College.
Chesterfield Technical College.
Coventry Technical College.
Cumberland Technical College, Workington.
Derby Technical College.
Enfield Technical College.
Ilkeston Technical Evening Institute.
Newport Technical College.
Rotherham College of Technology.
Scunthorpe Technical College.
Smethwick, The Chance Technical College.
Swansea Technical College.
Wednesbury, County Technical College.
Wolverhampton and Staffordshire Technical College.

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(b) *Higher Certificate :*

Battersea Polytechnic, London.
Birmingham Central Technical College.
Chesterfield Technical College.
Middlesbrough, Constantine Technical College.
Rugby College of Technology.
Rutherford College of Technology.
Wednesbury, County Technical College.
Wolverhampton and Staffordshire Technical College.

123 candidates entered and 74 qualified for the award of an Ordinary National Certificate in Metallurgy; and 38 candidates entered and 22 qualified for the Higher National Certificate in Metallurgy.

Distinctions were awarded to 13 candidates who showed an exceptional grasp of their subjects, indicating a high degree of training and knowledge in the particular subject in which the Distinction was gained.

Prizes, taken in books, were awarded to 19 successful candidates in the final examinations in 1947, from the Prize Fund established by the Iron and Steel Institute, the Institution of Mining and Metallurgy, and the Institute of Metals, for this purpose. Prizes will similarly be awarded to 17 successful candidates who have shown particular merit in the final examinations held in 1948.

The Joint Committee is pleased to note the increase in the number of candidates who entered for the final examinations for the Ordinary and Higher National Certificate in Metallurgy this year, and that there is a still greater increase in the number of students entering the first and second years of the courses.

OTHER NEWS

BEILBY MEMORIAL AWARDS

From the interest derived from the invested capital of the Sir George Beilby Memorial Fund, at intervals to be determined by the administrators representing the Royal Institute of Chemistry, the Society of Chemical Industry, and the Institute of Metals, awards are made to British investigators in science to mark appreciation of records of distinguished work. Preference is given to investigations relating to the special interests of Sir George Beilby, including problems connected with fuel economy, chemical engineering, and metallurgy, and awards are made, not on the result of any competition, but in recognition of continuous work of exceptional merit, bearing evidence of distinct advancement in science and practice.

In general, awards are not applicable to workers of established repute, but are granted as an encouragement to younger men who have done original independent work of exceptional merit over a period of years.

Consideration will be given to the making of an award or awards from the Fund early in 1949, and the administrators—the Presidents, Honorary Treasurers, and Secretaries of the three participating institutions—will be glad to have their attention drawn to out-

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standing work of the nature indicated, not later than 21 December 1948.

All communications on this subject should be addressed to the Convener, Sir George Beilby Memorial Fund, Royal Institute of Chemistry, 30 Russell Square, London, W.C.1.

IRON AND STEEL INSTITUTE

Autumn Meeting

The Autumn Meeting of the Iron and Steel Institute will be held at 4 Grosvenor Gardens, London, S.W.1, on Wednesday and Thursday, 10 and 11 November 1948. The technical sessions will take place from 10.0 a.m. to 1.15 p.m., and from 2.30 p.m. to 5.0 p.m. each day, and on both days a buffet luncheon will be served in the Joint Library from 1.15 to 2.30 p.m.

The following papers and reports will be presented and discussed :

Wednesday, 10 November.

Morning:

"A Note on the Varying-Turbulence Cowper Stove: The Denain-Anzin Tests and the CSI Standard Cowper Stove", by D. Petit.

"Magnetic Concentration Experiments upon Iron Ores in N. Lincs. Practice", by L. Reeve.

"The Work and Organization of a Statistical Department in Heavy Industry, with Particular Reference to the Steel Industry", by A. W. Swan.

Afternoon:

"The Application of Oxygen-Enriched Air to Side-Blown Converter Practice", by J. L. Harrison, W. C. Newell, and A. Hartley.

"Development of an Improved Basic Bessemer Steel", by H. A. Dickie.

"Ingot Structure in a Series from Rimmed to Killed Steel Made from the Same Cast", by P. M. Macnair.

Thursday, 11 November.

Morning:

"Ingot Surface Defects in Structural Steels", by L. Reeve.

"Open-Hearth Furnace Instrumentation", by E. Rogers.

"First Report of the Open-Hearth Instruments Sub-Committee", by F. L. Robertson.

"Rapid Estimation of Slag Basicity", by W. A. Smith, J. Monaghan, and W. Hay.

If time permits :

"A Note on the Determination of Moisture in Producer Gas", by J. Pearson and R. Toye.

Afternoon:

"Fatigue Tests on Crankshaft Steels", by P. H. Frith.

"A Magnetic Study of the Structure of Cold-Worked Iron-Nickel-Chromium Alloys (Stainless Steel Wires)", by P. T. Hobson, E. S. Chatt, and W. P. Osmond.

"The Inter-relation of Hardenability and Isothermal Transformation Data", by W. I. Pumphrey and F. W. Jones.

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INSTITUTION OF METALLURGISTS

A revised examination syllabus has been published (Handbook No. 2, Fourth Edition, August 1948), and may be obtained, free of charge, from the Registrar, Institution of Metallurgists, 4 Grosvenor Gardens, London, S.W.1.

DIARY FOR NOVEMBER

LOCAL SECTIONS MEETINGS

TUESDAY, 2 NOVEMBER

South Wales Local Section.—Ivor Jenkins, M.Sc., A.I.M.: “Controlled Atmospheres in Non-Ferrous Metallurgy”. (University College, Singleton Park, Swansea, at 6.30 p.m.)

THURSDAY, 4 NOVEMBER

Birmingham Local Section.—Students’ Evening. (Sir James Watt Memorial Institute, Great Charles Street, Birmingham, at 6.30 p.m.)

MONDAY, 8 NOVEMBER

Scottish Local Section.—F. E. Stokeld: “Forging and Stamp-
ing Non-Ferrous Metals”. (Institution of Engineers and Ship-
builders in Scotland, 39 Elmbank Crescent, Glasgow, C.2, at
6.30 p.m.)

THURSDAY, 11 NOVEMBER

London Local Section.—Professor W. R. Jones, C.B.E.,
B.Sc., D.I.C.: “Resources of Strategic Metals”. (Royal School
of Mines, South Kensington, London, S.W.7, at 7 p.m.)

TUESDAY, 16 NOVEMBER

Sheffield Local Section.—Dr. E. Orowan, F.R.S.: “Plastic
Working of Metals”. Joint meeting with the Sheffield Society
of Engineers and Metallurgists. (Sheffield Metallurgical Club,
West St., Sheffield, at 6.15 p.m.)

THURSDAY, 25 NOVEMBER

Birmingham Local Section.—T. Land, M.A., F.Inst.P.: High
Temperature Measurements”. (Sir James Watt Memorial
Institute, Great Charles Street, Birmingham, at 6.30 p.m.)

OTHER MEETINGS

TUESDAY, 2 NOVEMBER

Electrodepositors’ Technical Society, Midlands Centre.—
P. Berger, B.Sc.: “Barrel Plating and Barrel Finishing”. (James
Watt Memorial Institute, Great Charles St., Birmingham 3, at
6.30 p.m.)

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Institution of Engineers and Shipbuilders in Scotland.—W. Barr and A. J. K. Honeyman, B.Sc.: "Mild Steel in Ship Construction". (39 Elmbank Crescent, Glasgow, C.2, at 6.30 p.m.)

WEDNESDAY, 3 NOVEMBER

Manchester Metallurgical Society.—Dr. N. P. Allen: "Recent Developments at the National Physical Laboratory". Joint meeting with the Institute of Metals. (Engineers' Club, Albert Sq., Manchester, at 6.30 p.m.)

THURSDAY, 4 NOVEMBER

Chemical Society.—Professor W. T. Astbury, M.A., Sc.D., F.R.S.: "The Electron Microscope and Some Recent Discoveries with it in the Field of Macro-molecules". Joint meeting with the Sheffield University Chemical Society. (Chemistry Department Lecture Theatre, The University, Sheffield, at 5.30 p.m.)

Leeds Metallurgical Society.—Dr. R. Genders, M.B.E.: "Some Recent Lines of Metallurgical Development". (Chemistry Department, The University, Leeds 2, at 7 p.m.)

FRIDAY, 5 NOVEMBER

Institute of British Foundrymen, West Wales Section.—J. Blakiston: "Mechanical Aids to Coremaking". (Baldwin Canteen, Landore, at 7 p.m.)

West of Scotland Iron and Steel Institute.—Dr. A. L. Roberts: "Constitution-Property Relationships in Refractory Materials". Joint meeting with the Glasgow Section of the Society of Chemical Industry. (Royal Technical College, Glasgow, at 7.15 p.m.)

SATURDAY, 6 NOVEMBER

Institute of British Foundrymen, Wales and Monmouth Branch.—J. Blakiston: "Mechanical Aids to Core Production". (Engineers' Institute, Cardiff, at 6 p.m.)

WEDNESDAY, 10 NOVEMBER

Institute of British Foundrymen, Birmingham Branch.—G. M. Callaghan: "Non-Ferrous Metal Castings". (Dudley and South Staffs. Technical College, at 7.15 p.m.)

Institute of British Foundrymen, Lancashire Branch.—F. Nield: "Details of Some American Foundry Visits". (Engineers' Club, Albert Sq., Manchester, at 7 p.m.)

Iron and Steel Institute.—Autumn Meeting. (4 Grosvenor Gardens, London, S.W.1, 10.0 a.m. to 1.15 p.m. (buffet lunch, 1.15 to 2.30 p.m.); 2.30 to 5 p.m.)

THURSDAY, 11 NOVEMBER

Institute of British Foundrymen, Lincoln Section.—T. E. Hartley, B.Sc.: "An Evening of Light and Colour". (Technical College, Lincoln, at 7.15 p.m.)

Iron and Steel Institute.—Autumn Meeting. (4 Grosvenor Gardens, London, S.W.1, 10.0 a.m. to 1.15 p.m. (buffet lunch, 1.15 to 2.30 p.m.); 2.30 to 5 p.m.)

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Liverpool Metallurgical Society.—Dr. N. P. Inglis, M.Eng. : “A Review of Steels Used in the Chemical Industries”. Joint meeting with the Society of Chemical Industry. (The University, Brownlow Rd., Liverpool, at 7 p.m.)

FRIDAY, 12 NOVEMBER

Institute of British Foundrymen, Middlesbrough Branch.—D. Killingworth, B.Sc. : “The Venting of Cores and Moulds”. (Cleveland Scientific and Technical Institute, Corporation Rd., Middlesbrough, at 7.30 p.m.)

SATURDAY, 13 NOVEMBER

Institute of British Foundrymen, Newcastle Branch.—S. Finch : a paper on steel castings. (Neville Hall, Newcastle-on-Tyne, at 6 p.m.)

Institute of British Foundrymen, Scottish Branch.—Film presented by C. R. van der Ben and H. Hayes on “The Production of Grey Iron Castings”. (Royal Technical College, Glasgow, at 3 p.m.)

MONDAY, 15 NOVEMBER

Alembic Club, Oxford.—Dr. J. S. Anderson : “The Chemistry of Semi-Conducting Solids”. Alembic Club Lecture. (Physical Chemistry Laboratory, South Parks Rd., Oxford, at 8.15 p.m.)

Electrodepositors' Technical Society.—Annual General Meeting. P. Berger, B.Sc., and E. R. Baggott : “A Review of Immersion Plating Methods”. (Northampton Polytechnic, St. John St., Clerkenwell, London, E.C.1, at 5.30 p.m.)

Institute of British Foundrymen, Sheffield Branch.—F. Williams : “The Manufacture and Application of Water Turbines”. (Royal Victoria Hotel, Sheffield, at 7.30 p.m.)

WEDNESDAY, 17 NOVEMBER

Institute of Welding, West of Scotland Branch.—R. H. Bannister : “Design and Performance of Welding Apparatus”. (39 Elmbank Crescent, Glasgow, C.2, at 6.45 p.m.)

Manchester Metallurgical Society.—J. S. Blair, D.Sc. : “Manufacture of Steel Tubing”. (Engineers' Club, Albert Sq., Manchester, at 6.30 p.m.)

THURSDAY, 18 NOVEMBER

Chemical Society.—Dr. R. P. Linstead, C.B.E., F.R.S. : “The Chemical Research Laboratory, Teddington”. Joint meeting with the Local Sections of the Royal Institute of Chemistry and the Society of Chemical Industry. (North British Station Hotel, Edinburgh, at 7.30 p.m.)

Institute of Welding, North London Branch.—O. Bondy : “Welding in Constructional Engineering”. (Polytechnic, Regent St., London, W.1, at 7.30 p.m.)

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FRIDAY, 19 NOVEMBER

West of Scotland Iron and Steel Institute.—W. G. Scott: "Roll Founding". (39 Elmbank Crescent, Glasgow, C.2, at 6.45 p.m.)

THURSDAY, 25 NOVEMBER

Institute of Welding.—Dr. H. Gottfeldt: "Curved Bridges and Why They Should be Welded". Joint meeting with the Institution of Structural Engineers. (11 Upper Belgrave St., London, S.W.1, at 6 p.m.)

FRIDAY, 26 NOVEMBER

Electrodepositors' Technical Society, Sheffield and North-East Centre.—N. A. Tope, A.C.T.C.: "Factors Affecting the Distribution of Electrodeposits". (Grand Hotel, Sheffield, at 6.30 p.m.)

TUESDAY, 30 NOVEMBER

Institution of Engineers and Shipbuilders in Scotland.—Dr. C. D. Weir, B.Sc.: "Recent Research in Caustic Cracking in Boilers". (39 Elmbank Crescent, Glasgow, C.2, at 6.30 p.m.)

APPOINTMENTS VACANT

To conform to the requirements of the Control of Engagements Order, 1947, these advertisements are published for the information only of those who are "excepted persons" under the Order.

APPLICATION ENGINEER required to join the selling organization of large Instrument Manufacturers for the promotion of instrumentation in the metal industry. Applicants must have strong personality, be of engineering degree standard, and have experience in the processes of iron and steel manufacture. Box No. 246, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

METALLURGIST required for Industrial Research Laboratory. Candidates should have good degree and preferably have had previous research experience. Knowledge of creep and/or extrusion of metals, or a good general knowledge of the rheological properties of metals, would be an advantage. Applications should be made in writing giving details of qualifications, experience, age, and salary required to Box 3785, c/o White's, Ltd., 72 Fleet Street, London, E.C.4.

METALLURGIST required for Laboratory of large Engineering Works in Oxfordshire. Must possess honours degree in metallurgy, or equivalent. Main duties concerned with the scientific control of manufacturing processes, raw materials, and Company products. Full details of experience, age, &c., to Box No. 245, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

METALLURGIST TECHNICAL MANAGER required with various smelting experience for ferro alloy manufactory in Midlands. Special ability at metallurgical chemical calculations is necessary. The position involves complete metallurgical and technical control of the works and production. The post is an exceptional opportunity for a brilliant manager technician, is permanent, and will carry a high remuneration. Please send fullest type-written details to Box No. 243, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

APPOINTMENT REQUIRED

A CHIEF ENGINEER AND MANAGER Technical Department gas appliance development, aged 40, resident London, now available, £1000 upwards. Experienced co-ordination of design, testing, development, also of research, production, distribution, with correct approach yielding practical results. Box No. 244, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

THE INSTITUTE OF METALS

President :

Sir ARTHUR SMOUT, J.P.

Secretary and Editor of Publications :

Lieut.-Colonel S. C. GUILLAN, T.D.

Assistant Editor :

Major W. G. ASKEW, M.C.

Assistant Secretary :

Major R. E. MOORE

Administrative and Editorial Offices :

4 GROSVENOR GARDENS, LONDON, S.W.1

Telephone :

SLOANE 6233

INSTITUTE NEWS AND ANNOUNCEMENTS

HONORARY MEMBER OF COUNCIL

Major-General W. S. Tope, C.B., C.B.E., Director of Royal Electrical and Mechanical Engineers, has succeeded Major-General Sir Eustace Tickell, K.B.E., C.B., M.C., as an Honorary Member of Council of the Institute, representing the War Office.

STUDENTS' TOUR

An educational tour for Student Members of the Institute has now definitely been arranged to take place in Birmingham from 4 to 8 April 1949. The cost of the tour to those taking part will be kept at a minimum, and accommodation has been arranged at Chancellor's Hall.

Many metallurgical and engineering firms in the Birmingham area have stated their willingness to receive parties of Student Members in connection with this tour, which should prove of great educational value.

Full particulars will be sent to all Student Members at an early date. In the meantime, those who desire to take part are requested to make the necessary arrangements to be free for this tour.

LOCAL SECTIONS MEETINGS

A folder programme of meetings of the Local Sections and of Associated Societies during the session 1948-49 has been sent to all members resident in the British Isles. A copy will be sent, on application, to any overseas member who may be interested.

LIST OF MEMBERS

Mr. H. H. Symonds has succeeded Mr. A. MacArthur as Honorary Treasurer of the Birmingham Local Section. In consequence will members please delete from p. 4 of the List of Members all reference to Mr. MacArthur, and substitute : *Honorary Treasurer* : H. H. Symonds, Midland Laboratory Guild (1928), Ltd., King Alfred Place, Broad St., Birmingham.

NEWS AND ANNOUNCEMENTS

PERSONAL NOTES

MR. P. BAKER has left his position as Metallurgical Chemist in the Central Research Department of British Wire Ropes, Ltd., to become a Technical Trainee in the Doncaster works of the same firm.

MR. C. DANGERFIELD has been awarded the degree of B.Met. (Honours in Non-Ferrous Metallurgy) of Sheffield University, and is now employed in the Research Laboratories of the British Aluminium Co., Ltd., Gerrards Cross.

MR. ELWYN LL. EVANS, B.Sc., has been appointed a Scientific Officer at the Metallurgy Division of the National Physical Laboratory, Teddington.

DR. F. C. FRARY, Director of Research of the Aluminum Company of America, was awarded the Gold Medal of the American Society for Metals at the annual banquet of the Society on 28 October, "for outstanding metallurgical knowledge and great versatility in the application of Science to the metal industry, as well as exceptional ability in the diagnosis and solution of diversified metallurgical problems".

MR. RAYMOND HAYNES has obtained the degree of B.Met. of Sheffield University with first-class honours in non-ferrous metallurgy. The University have also awarded him the Mappin Medal for metallurgy, the Nesthill Medal for non-ferrous metallurgy, and a George Senior Research Fellowship in metallurgy.

DR. M. KHAN, M.Sc., has been awarded the degree of Ph.D. in Metallurgy of Leeds University.

MR. TAUN KO, B.Sc., has been appointed a lecturer in metallurgy at Birmingham University.

MR. J. MACKENZIE has been awarded the degree of B.Sc. of Durham University and has left England for South Africa to join the metallurgical staff of the Union Corporation Group of gold mines in South Africa. His address is Flat No. 15, Palmietfontein Section, Grootvlei Proprietary Mines, Ltd., Box 445, Springs, Transvaal.

MR. E. R. PERRY, D.F.C., has taken up an appointment with the Baker Platinum Co., Ltd., 52 High Holborn, London, W.C.1.

DR. T. L. RAMA CHAR, M.Sc., A.R.I.C., has been elected an Associate of the Institute of Physics.

DR. GEORGE SACHS has left Europe, en route for India, where he will take up his appointment as Director of the National Metallurgical Laboratory at Jamshedpur.

DR. EARLE C. SMITH, E.M., Chief Metallurgist, Republic Steel Corporation, has been awarded the Lamme Medal of Ohio State University.

MR. ROBERT A. STAUFFER, B.S., has been appointed Assistant Director of Research of the National Research Corporation, Cambridge, Mass., U.S.A.

MR. E. T. STEWART-JONES is now working for the Société pour le Forgeage et l'Estampage des Alliages Légers; his address is c/o Forgeal, Issoire, Puy-de-Dôme, France.

NEWS AND ANNOUNCEMENTS



AUTUMN MEETING, CAMBRIDGE.

Some caricatures by "Mel", reproduced by courtesy of *The Metal Industry*.

NEWS AND ANNOUNCEMENTS

DR. C. SYKES, F.R.S., and MR. D. A. OLIVER, M.Sc., have been appointed to the Committee of the British National Committee for Crystallography under the Chairmanship of Sir Lawrence Bragg. Mr. Oliver is the representative of the Institute of Metals.

MR. D. E. J. TALBOT, B.Sc., is now engaged as a Research Metallurgist with the Metallurgical Branch, Armaments Research Establishment, Royal Arsenal, Woolwich.

MR. C. J. WILLIAMS, L.I.M., has been appointed Die Foundry Superintendent with High Duty Alloys, Ltd., Slough, Bucks.

DEATHS

The Editor regrets to record the deaths of the following members :

DR. CLARENCE WILLIAM BALKE, for many years Director of Research of the Fansteel Metallurgical Company, Chicago, Ill., U.S.A., on 8 July 1948.

MR. THOMAS JAMES RICKARD, of Wednesfield, on 26 September 1948.

LETTER TO THE EDITOR

SIR,

If I avoid contentious matters or any fairly to be described as a matter of opinion in connection with your book notices, I may be allowed to refer to the fact that, in the only two reviews of my little book "Essential Metallurgy for Engineers" which have appeared in the Abstracts of the *Journal*, side steps have been executed around its significant feature.

My book was written with a rather special object: numbers of other reviewers have acknowledged this, and have paid tribute of some kind to the difficulties inherent in this particular pioneering effort to supply a specific engineering demand.

I am anxious to make this clear, if possible; for no member cares to be misrepresented in our *Journal*, and it so happens that I should have had less than no inclination to write just another of the short treatises in the usual style which have been offered as "Metallurgy for Engineers". Rightly or wrongly, I have always considered these misnamed. It has been discouraging, therefore, to find that your reviewers, in having restricted their criticism to weaknesses in mode of expression and in details of purely metallurgical items, must have left an impression that my book offers nothing unusual. Naturally, I am very willing to make use of any constructive suggestion whatsoever: the second and third editions bear me ample witness.

Perhaps the reviewers in question either feared or resented a deviation from orthodoxy, whatever its potentialities. Our leaders can be relied upon to safeguard the high standing of the profession by "hastening slowly" without standing still; and they can do this the better by discussing a feature of metallurgical presentation which was immediately recognized as fresh and generally hailed with an appreciation which compensated me well for my struggles with a new medium.

Yours, &c.,

A. C. VIVIAN.

LOCAL SECTIONS NEWS

LONDON LOCAL SECTION

On 7 October, at 4 Grosvenor Gardens, London, S.W.1, the retiring Chairman of the Section, Dr. J. H. WATSON, M.B.E., M.C., B.Sc., A.R.S.M., after thanking the members for their support during his term of office, inducted into the Chair his successor, Mr. W. F. RANDALL, B.Sc., A.R.S.M., M.I.E.E., F.I.M., who then delivered his Chairman's Address on:

Instrument Alloys.

The Address dealt with a range of alloys which are not covered in the usual non-ferrous discussion and commentary, i.e. alloys with specific and unusual physical characteristics which adapt them for use in the manufacture of scientific apparatus or commercial instruments.

The following were discussed: alloys with a low coefficient of heat expansion, of which Invar and its variants are representative, and the use of such alloys and cognate compositions as the low expansion element in bimetallic strip; the type of alloy used for the high expansion element in bimetals, with comments on various compositions, including a copper-manganese-nickel alloy containing 18% manganese, and the use of such high expansion alloys for dilatation thermometers; the adaptation of expansion characteristics to that of glasses, to permit the manufacture of glass-to-metal seals, and the methods of manufacture and metallurgical characteristics of various suitable alloys.

The lecturer then dealt with alloys, particularly nickel-irons, with special magnetic characteristics, with notes on the exacting procedure necessary to obtain the best properties; magnetostrictive alloys used for frequency standards; the properties and uses of copper-manganese-nickel and copper-manganese-aluminium alloys, which have a very low temperature coefficient of electrical resistance; the manganese-copper series, in which extremely high electrical resistivities are experienced; alloys which show a very rapid increase in resistivity with temperature; thermo-electrical properties of alloys and their relation to instrument manufacture; spring alloys, including beryllium-copper, Elinvar, and recent variations of the latter; magnetic shunt alloys with a diminishing temperature-permeability characteristic used for temperature compensation in magnetic circuits; and, finally, the preparation and properties of alloys used in valve manufacture.

SOUTH WALES LOCAL SECTION

MR. D. W. HOPKINS, M.Sc., A.I.M., delivered his Chairman's Address at the first meeting of the session on 12 October, at the Royal Institution, Swansea. After paying tribute to the efforts of his predecessor, Mr. Harry Davies, and thanking the members for the honour that they had conferred on him, Mr. Hopkins addressed the meeting on:

The Production of Uncommon Metals by Special Methods.

He said that examination of data on the production of the common metals by methods other than electrolysis had shown that the

NEWS AND ANNOUNCEMENTS

majority were most economically produced by either carbon reduction of the oxide, or interaction between the oxide and sulphide at temperatures up to about 1600°C . and at pressures of 1 to 2 atm. Nickel by the carbonyl process was the only major exception. That the common metals, normally regarded as capable only of production by electrolysis, could be reduced by carbon under certain special conditions of temperature and pressure had been shown to be possible in the papers of Ellingham in Britain and by de Kay Thompson in America. Work on similar lines on the metallic sulphides by Kelley and on the halides and carbides by other investigators had shown that there were series, similar to the electrochemical series in that the compounds could be placed in order of stability when in contact with other metals in the same series. In addition to providing information on the common metals, these results indicated new methods of approach to the problems associated with the production of the rarer metals. The major obstacle to general adoption of these methods was the absence of apparatus of adequate capacity capable of operating at pressures of the order of 10 microns and at temperatures up to about 1200°C . The advent of such apparatus and the development of alloys capable of withstanding the temperature and pressure at values up to 1200°C . had been utilized in the production of magnesium by the Pidgeon process. This process was of special interest in that the vacuum technique was used in conjunction with a reducing agent, silicon, the efficiency of which could be forecast from published data. Later advances in vacuum operation had reduced the pressure available to 10^{-3} microns in plant of a capacity of hundreds of pounds of metal a day.

The application of these special techniques to the production of beryllium and zirconium was described, starting with the production of magnesium by ferro-silicon reduction and calcium by aluminium reduction. These intermediate materials were then used to prepare beryllium by reduction of the fluoride and zirconium by the reduction of the chloride. The preparation of the purified compounds of beryllium and zirconium was described and the separation of the metals from the calcium and magnesium compounds after reaction. A brief account was given of the properties and applications of the two metals.

JOINT ACTIVITIES

MOND NICKEL FELLOWSHIPS

The Mond Nickel Fellowships Committee has announced the following three awards for 1948:

MR. S. G. CAMPBELL (Plessey Company, Ltd.). To study the various stages of the organization from research to large-scale production of specialized metallurgical industries in the United States of America and Canada.

MR. S. J. GARVIN (Murex, Ltd.). To study the application of sponsored research, and the administrative methods employed, in the powder metallurgical industries in the United States of America.

NEWS AND ANNOUNCEMENTS

MR. A. I. NUSSBAUM (Thos. Firth and John Brown, Ltd.).
To study the application of rolling mill research, mill plant development, and the theory of rolling to the manufacture of rolled steel products.

The Mond Nickel Fellowships Committee will at a later date invite applications for awards for 1949. Full particulars of the Fellowships can be obtained from the Secretary, Mond Nickel Fellowships Committee, 4 Grosvenor Gardens, London, S.W.1 (Telephone SLOane 0061).

NATIONAL CERTIFICATES IN METALLURGY PASS LIST, YEAR 1947-48

Senior Part-time Course for Ordinary National Certificate

Battersea Polytechnic, London.	<i>Distinctions Awarded.</i>
Betts, John William George . . .	General Metallurgy.
Blewett, Richard Vernon
Day, Joseph George
Fricker, Dennis John . . .	General Metallurgy.
Hall, Edward George
Hampton, Donald Frederick George
Mansfield, Donald Eugene
Perkins, Raymond Frank
Threadgold, Peter Roland
Webster, Philip David
Wingfield, Peter Maurice

Birmingham Central Technical College.

Bettington, Philip Josiah . . .	...
Davies, Dennis . . .	...
Hadwin, Kenneth David . . .	...
Hughes, Donald Ernest . . .	...
Lloyd, Raymond Charles . . .	Metallurgy II. Chemistry II.
Phelps, Robert Edward . . .	...
Smith, Donald Norman . . .	Metallurgy II.
Thornton, Peter Howard . . .	...
Whitley, Gerald Henry Charles . . .	...

Chesterfield Technical College.

Bonsall, Peter . . .	Inorganic Chemistry.
Burrows, Alwyne George . . .	Inorganic Chemistry. Physical Chemistry. General Metallurgy.
Frost, George Malcolm . . .	...
Havenhand, William . . .	Inorganic Chemistry.
Peach, Raymond
Preece, Michael Ian
Sharman, John Colin
Thompson, Bernal

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	<i>Distinctions Awarded.</i>
Coventry Technical College.	
Heritage, Stanley John
Monk, Ivan Barry . . . . .	...
Swift, Patrick Bernard . . . . .	...
Timms, Ralph Graham . . . . .	...
Townsend, Harry . . . . .	...
Wood, Brian Ernest . . . . .	...
Cumberland Technical College, Workington.	
Brenan, Colin . . . . .	...
Hall, Alan . . . . .	...
Jackson, Leslie	Chemistry.
Tate, Reginald	Chemistry.
	Metallurgy.
	Physics.
Enfield Technical College.	
Hickford, Jean Haidee . . . . .	...
Joslin, George Herbert . . . . .	...
Read, Allan William . . . . .	...
Ilkeston Technical Institute.	
Tomlinson, Gordon Raymond . . . . .	...
Newport Technical College.	
Cantelo, Philip John . . . . .	...
Meredith, Keith Edward . . . . .	...
Oliver, Kenneth Arthur	Chemistry.
	General Metallurgy.
Thompson, John Alfred . . . . .	...
Waring, Peter . . . . .	...
Rotherham College of Technology.	
Concannon, William . . . . .	...
Eyre, Joseph . . . . .	...
Hepworth, Gordon . . . . .	...
Keech, Reginald . . . . .	...
Monks, John . . . . .	...
Short, Richard A. . . . .	...
Stevens, Malcolm	Physics.
Timmins, Arnold . . . . .	...
Williams, Jack . . . . .	...
Scunthorpe Technical School.	
Bray, Bernard . . . . .	...
Smethwick, The Chance Technical College.	
Bennett, Horace . . . . .	...
Povey, Desmond . . . . .	...
Turner, Geoffrey Royston	Physics.
Westley, Kenneth Cyril . . . . .	...
Wragge, Gerald Patrick . . . . .	...

NEWS AND ANNOUNCEMENTS

Swansea Technical College.	<i>Distinctions Awarded.</i>
Cumming, John Baker
Davies, Colin James
Evans, Leslie George
Grey, Owen
Lloyd, Leonard Marsden
Richards, John Derek

Wednesbury, County Technical College.	
Beddow, Alfred . . . .	...
Clitheroe, John Michael . . . .	...
Hares, William Charles . . . .	...
Hughes, Leonard Trevor . . . .	...
Johns, Raymond . . . .	...
Lycett, Willis Frederick . . . .	...

Advanced Part-time Course for Higher National Certificate

Battersea Polytechnic, London,	<i>Distinctions Awarded.</i>
Dunthorne, Hector Barrett
Hull, William Griffin

Birmingham Central Technical College.	
Hearnshaw, Gwendoline Frances . . . .	...
Rogers, Colin Francis . . . .	...

Chesterfield Technical College.	
Cumberland, John . . . .	...
Fearn, Eric Bernard Nelson . . . .	...
Geary, Roy . . . .	...
Pyrar, Alan . . . .	...
Slater, John Linder . . . .	...
Turner, Luther . . . .	...

Rugby College of Technology.	
Ashton, Geoffrey	Inorganic and Physical Chemistry.

Rutherford College of Technology.	
Allon, Frederick R. H. . . .	...
Brown, James Albert . . . .	...
Chennels, William . . . .	...
Millican, Frederick Douglas . . . .	...

Wednesbury, County Technical College.	
Boys, Sidney Joseph Henry . . . .	...
Doo, Betty . . . .	...
Winfield, Gerald . . . .	...

Wolverhampton & Staffordshire Technical College.	
Cartwright, Harry . . . .	...
Hipwell, Robert Charles . . . .	...
Walsh, Marjorie Elaine . . . .	...
Wilkes, Thomas Orlando George . . . .	...

NEWS AND ANNOUNCEMENTS

OTHER NEWS

FOURTH EMPIRE MINING AND METALLURGICAL CONGRESS, JULY 1949

Members who are interested in, or who are proposing to attend, this Congress are requested to complete and return to the organizers, as soon as possible, the reply form that was included in the first circular which they should have received.

POROSITY IN ELECTRODEPOSITS

American Electroplaters' Society Fellowships

The Research Committee of the American Electroplaters' Society has recently announced the establishment of a second fellowship at Princeton University to intensify the study of the nature and effects of porosity in electrodeposits.

The first fellowship, established in 1946, has already developed a unique and original method for studying porosity. The electrodeposited foil is stripped from the base metal and its permeability to a gas is measured. Experimentally, a characteristic constant for each metal is obtained. This is the time required to reduce a given pressure difference across the foil to half its original value. Preliminary work indicates that there is a linear relationship between the logarithm of the half-time and the thickness. The Research Committee believes that this method gives the first reproducible quantitative measurements on porosity that have been obtained anywhere or at any time.

Dr. Nathaniel Thon, who is the Project Director, has obtained the services of Dr. L. Yang as Research Associate. Dr. Yang has recently completed three years' research under Professor G. I. Finch at the Applied Physical Chemistry Laboratory of Imperial College, University of London. At London University he studied the growth and structure of electrodeposits by electron diffraction procedures.

The members of the Project Directing Sub-Committee associated with this project are Dr. W. A. Wesley, Chairman of the International Nickel Company; Mr. A. Mendizza, of the Bell Telephone Laboratories; and Dr. B. Egeberg, of the International Silver Company.

DIARY FOR DECEMBER

LOCAL SECTIONS MEETINGS

Birmingham Local Section.—B. Coates: "The Treatment and Properties of Springs". (James Watt Memorial Institute, Great Charles St., Birmingham, Thursday, 2 December, at 6.30 p.m.)

London Local Section.—Annual Dance. (4 Grosvenor Gardens, London, S.W.1, Friday, 3 December, at 7 p.m.)

Scottish Local Section.—G. Meikle: "The Uses of Non-Ferrous Metals for Aircraft". (Institution of Engineers and Shipbuilders in Scotland, 39 Elmbank Crescent, Glasgow, C.2, Monday, 13 December, at 6.30 p.m.)

NEWS AND ANNOUNCEMENTS

Sheffield Local Section.—Dr. L. B. Hunt: "The Electro-metallurgy of Silver". Joint meeting with the Sheffield Branch of the Electrodepositors' Technical Society. (Grand Hotel, Sheffield, Thursday, 16 December, at 6.30 p.m.)

OTHER MEETINGS

WEDNESDAY, 1 DECEMBER

Liverpool Metallurgical Society.—L. W. Johnson: "The Co-Relation of Metallurgical Research and Development with Engineering Requirements". Joint meeting with the Liverpool Engineering Society. (Liverpool Engineering Society, 9 The Temple, 24 Dale St., Liverpool, at 7 p.m.)

Manchester Metallurgical Society.—F. Fancutt and Dr. J. C. Hudson: "Prevention of Corrosion". (Engineers' Club, Albert Sq., Manchester, at 6.30 p.m.)

THURSDAY, 2 DECEMBER

Chemical Society.—Sir Wallace Akers: "Problems in the Production of Useful Power from Nuclear Energy". Joint meeting with the Sheffield Local Section of the Royal Institute of Chemistry and the Sheffield University Chemical Society. (Chemistry Department Lecture Theatre, The University, Sheffield, at 6 p.m.)

Leeds Metallurgical Society.—Dr. J. Ward: "Recent Developments in Photoelasticity". (Chemistry Dept., The University, Leeds 2, at 7 p.m.)

FRIDAY, 3 DECEMBER

Chemical Society.—Dr. E. A. Moelwyn-Hughes: "The Liquid State". Joint meeting with the University of Birmingham Chemical Society. (Main Lecture Theatre, Chemistry Dept., The University, Edgbaston, Birmingham, at 4.30 p.m.)

TUESDAY, 7 DECEMBER

Electrodepositors' Technical Society, Midlands Centre.—H. A. Holden: "Latest Developments in Phosphate Coating Methods and Technique". (James Watt Memorial Institute, Great Charles St., Birmingham 3, at 6.30 p.m.)

THURSDAY, 9 DECEMBER

Institute of Welding, South London Branch.—H. F. Tremlett: "Some Aspects of the Metallurgical Side of Welding". (Institute of Marine Engineers, 85-88 The Minories, London, E.C.3, at 6.30 p.m.)

MONDAY, 13 DECEMBER

Electrodepositors' Technical Society.—P. B. Upton: "Electrodeposition in the Printing Industry". (Northampton Polytechnic, St. John St., Clerkenwell, London, E.C.1, at 5.30 p.m.)

TUESDAY, 14 DECEMBER

Institution of Structural Engineers, Lancashire and Cheshire Branch.—R. A. Foulkes: "The Use of Light Alloys in Structures". (College of Technology, Manchester, at 7 p.m.)

NEWS AND ANNOUNCEMENTS

WEDNESDAY, 15 DECEMBER

Geological Society of London.—Ordinary Evening Meeting. (Burlington House, Piccadilly, London, W.1, at 5 p.m.)

Institute of Welding, North London Branch.—Open discussion on Welding Methods. (East Ham Technical College, London, at 7.30 p.m.)

Institute of Welding, West of Scotland Branch.—H. Martin: "The Technical Aspects in the Selection of Electrodes". (39 Elmbank Crescent, Glasgow, C.2, at 6.45 p.m.)

THURSDAY, 16 DECEMBER

Electrodepositors' Technical Society, Sheffield and North-East Centre.—Dr. L. B. Hunt: "Electrometallurgy of Silver". Joint meeting with the Sheffield Local Section of the Institute of Metals. (Grand Hotel, Sheffield, at 6.30 p.m.)

Institution of Mining and Metallurgy.—General Meeting. (Geological Society, Burlington House, London, W.1, at 5 p.m.)

FRIDAY, 17 DECEMBER

West of Scotland Iron and Steel Institute.—J. Monaghan: "The Application of Slag Control to the Manufacture of Tube Steel"; R. P. Towndrow: "Factors Affecting the Quality of Pig Iron for Steel Making." (39 Elmbank Crescent, Glasgow, C.2, at 6.45 p.m.)

APPOINTMENTS VACANT

To conform to the requirements of the Control of Engagement Order, 1947, these advertisements are published for the information only of those who are "excepted persons" under the Order.

BRITISH NON-FERROUS METALS RESEARCH ASSOCIATION has the following vacancies on its research staff: *Metallographer* with wide experience of non-ferrous metals and alloys to take charge of the Association's metallographic laboratory. *Metallurgist* with experience in mechanical testing to undertake research on metallurgical factors affecting the creep of non-ferrous alloys at elevated temperatures. The salary for each post will depend upon qualifications and experience. Applicants must be British and should apply, stating salary required, to the Secretary, British Non-Ferrous Metals Research Association, 81-91 Euston Street, London, N.W.1.

METALLURGIST required for Laboratory of large Engineering Works in Oxfordshire. Must possess Honours Degree in Metallurgy, or equivalent. Main duties concerned with the scientific control of manufacturing processes, raw materials, and Company products. Full details of experience, age, &c., to Box No. 245, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

THE INSTITUTE OF METALS

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INSTITUTE NEWS AND ANNOUNCEMENTS

REPRESENTATION OF THE INSTITUTE

MR. A. J. MURPHY, M.Sc., F.I.M., has been appointed to be a representative of the Institute on the General Board of the National Physical Laboratory, with effect from 1 January 1949, in succession to Mr. H. S. Tasker, B.A., whose period of service in this capacity terminates on 31 December.

MR. W. A. BAKER, B.Sc., MR. R. B. DEELEY, B.Sc., A.R.S.M., and MR. E. RAYBOULD, have been appointed representatives of the Institute on British Standards Institution Sub-Committee NFE/—/5.—Terminology of Casting Defects.

ELECTION OF ORDINARY MEMBERS AND STUDENT MEMBERS

The following 15 Ordinary Members and 16 Student Members were elected on 10 November 1948 :

As Ordinary Members

CONTRACTOR, G. P., M.Sc., Ph.D., Assistant Director, National Metallurgical Laboratory, Jamshedpur, India.

COTTELL, George Arthur, M.Sc., Research Engineer, 24 Fennel Street, Manchester 4.

DELRUELLE, André, Ing.civil Mines, Administrateur-Directeur, S.A. Métallurgique de Prayon, rue au Rys 20, Prayon-Trooz, Belgium.

EVANS, Frederick Aubrey, Assistant Foundry Manager, Wellworthy Piston Rings, Ltd., Lymington, Hampshire.

FOX, Cecil Percy, M.Sc. (Eng.), Research Engineer, The London Electric Wire Company and Smiths, Ltd., London.

GAMWELL, Alfred, The Consolidated Dental Manufacturing Company, Ltd., 1A, Shamworth Road, Aigburth, Liverpool.

GEERLINGS, Hendrik G., Dr.Ir., Chief, Metals Research Department, Laboratorium N.V. De Bataafsche Petroleum Maatschappij, Badhuisweg 3, Amsterdam-N., Holland.

NEWS AND ANNOUNCEMENTS

- GIFFORD, David Neef, M.B.E., M.A., Manager, Electric Furnace Company, Ltd., Birmingham.
- GUPTA, Hari Shanker, B.Sc., c/o Hiralal Motilal and Brothers Jawahergunj, Jubbulpore (C.P.), India.
- JOHNSTON, Dominick, M.Sc., Lecturer in Metallurgy, Department of Fuel, The University, Leeds.
- MITCHELL, Albert, General Manager and Secretary, Bede Metal and Chemical Company, Ltd., Hebburn, Co. Durham.
- MONDOLFO, Professor Lucio F., Dr.Eng., Associate Professor of Metallurgy, Illinois Institute of Technology, 3300 S. Federal Street, Chicago, Ill., U.S.A.
- MOTT, Professor Nevill Francis, M.A., D.Sc., F.R.S., Professor of Theoretical Physics, University of Bristol, H. H. Wills Physical Laboratory, Royal Fort, Bristol 8.
- REID, William Alexander, B.Sc., Research Engineer, Anti-Attrition Metal Company, 22 Pinkneys Road, Maidenhead, Berkshire.
- URBANO, Luis, Executive Secretary, Instituto del Hierro y del Acero, Calle Villanueva 15, Madrid, Spain.

As Student Members

- BUTLER, Dennis Hubert, B.Sc., Bursar, British Non-Ferrous Metals Research Association, Euston Street, London, N.W.1.
- ELLIOTT, John Eric, B.Sc., Research Metallurgist, The Mond Nickel Company, Ltd., Wiggin Street, Birmingham.
- GOWER, Robert, Assistant Metallurgist, Parsons Chain Company, Ltd., Worcester Road, Stourport-on-Severn, Worcestershire.
- HIGGS, John Yuill, B.Sc., Research Officer, Tin Research Institute, Fraser Road, Greenford, Middlesex.
- HISCOCK, Sidney Alfred, B.Sc., Metallurgist, Arc Manufacturing Company, Ltd., London, N.W.1.
- ING, Ronald John, Research Assistant, Tin Research Institute, Fraser Road, Greenford, Middlesex.
- KING, Douglas Edward, Student of Metallurgy, University of Sheffield.
- NUNN, Peter Hubert, Student of Metallurgy, King's College, Durham University, Newcastle-on-Tyne.
- PATERSON, Raymond Dougal, Assistant Metallurgist, Manganese Bronze and Brass Company, Ltd., Ipswich, Suffolk.
- SAXENA, Mahesh Narain, B.Sc., Student of Metallurgy, Benares Hindu University, India.
- SHARPE, Roy Samuel, B.Sc., Physicist (X-Ray Metallographer), Bristol Aeroplane Company, Ltd., Bristol.
- SHRIVASTAVA, Onkar D., Junior Field Officer (Steel), Controller of Railway Supplies, Railway Board, Ministry of Railways, New Delhi, India.
- SMITH, Eric George, B.A., Apprentice, Northern Aluminium Company, Ltd., Rogerstone, Monmouthshire.
- SUTTON, Alan Lee, Student, Clare College, Cambridge.
- TAYLOR, John Welsh, Research Student, Royal Technical College, Glasgow.
- TAYLOR, (Miss) June Audrey, B.A., Research Bursar, British Non-Ferrous Metals Research Association, Euston Street, London, N.W.1.

NEWS AND ANNOUNCEMENTS

PERSONAL NOTES

MR. J. BERGMANN, L.I.M., has recently taken up an appointment as Metallurgist with Stewarts and Lloyds, Ltd., at Corby.

MR. J. M. BOXALL has been awarded the degrees of B.Sc. (Metallurgy) and A.R.S.M. (First-Class Honours) of London University, and has taken up a post as Metallurgist in the Research Department of the National Smelting Company, Ltd., Avonmouth.

SIR LAWRENCE BRAGG, O.B.E., M.C., F.R.S., has been awarded the Roebling Medal of the Mineralogical Society of America.

DR. BERNARD D. CULLITY, B.Eng., M.S., recently engaged in research in physical metallurgy at the Centre de Recherches, École des Mines, Paris, is now with the office of Naval Research, American Embassy, in London, as a scientific liaison officer.

MR. A. P. GREENOUGH, B.A., has left H.M. Forces and is now again working at the Royal Aircraft Establishment, Farnborough.

MR. LAURENCE J. A. HAYWOOD, Chief Chemist, Catton and Co., Ltd., Yorkshire Steel Foundry, Leeds, has now been appointed Chief Chemist and Metallurgist, in charge of steel manufacture, treatment, and analysis.

MR. H. F. MATON has been elected a Member of the Institution of Mechanical Engineers.

MR. W. A. C. NEWMAN, O.B.E., B.Sc., A.R.S.M., A.R.C.S. (Honorary Treasurer of the Institute of Metals) has been elected President of the Institution of Mining and Metallurgy for the year 1949-50.

MR. J. PENDLETON, B.Eng., has left the British Non-Ferrous Metals Research Association to take up an appointment with the Department of Atomic Energy, Ministry of Supply, Risley.

MR. JOHN RAE, JR., has recently been appointed Joint Managing Director of McKechnie Brothers, South Africa (Pty.), Ltd., Germiston, Transvaal, and left England this month for South Africa.

MR. H. A. SNOW has been appointed a Director of Messrs. E. L. Forge and Partners, Ltd., consulting and development engineers, of 48 Gloucester Place, London, W.1.

MR. R. W. THOMAS, B.Sc., L.I.M., recently left Messrs. David Brown and Sons (Huddersfield), Ltd., to take up an appointment as Metallurgist with K. and L. Steelfounders and Engineers, Ltd., Letchworth, Herts.

MR. A. B. WINTERBOTTOM, M.Sc.Tech., is now at the Metallurgisk Institutt, Norges Tekniske Høgskole, Trondheim, Norway.

DEATH

The Editor regrets to announce the death, on 21 October 1948, of MR. F. C. MANNOX, Managing Director of Messrs. Murex, Ltd., Rainham, Essex.

NEWS OF LOCAL SECTIONS AND OF ASSOCIATED SOCIETIES

BIRMINGHAM LOCAL SECTION

Symposium on Techniques of Metallurgical Investigation

The symposium will be held on Friday, 18 February 1949, at the Chamber of Commerce, New Street, Birmingham, where seating is available for 200 persons. It will deal with modern advances in technique of testing and examination of non-ferrous metals and alloys. There will be three 2-hr. sessions on (1) Mechanical Testing, (2) Metallography—The Microscope, and (3) Metallography—Other Aspects. At each session three papers will be presented and a discussion will follow, in which supplementary communications will be welcome. Advance synopses of the papers will be sent to those who register to take part in the symposium. Further information can be obtained from the Honorary Secretary, Mr. E. H. Bucknall, M.Sc., 53 Halesowen Road, Quinton, Birmingham 32.

LEEDS METALLURGICAL SOCIETY

High-Speed Photography

At a meeting held on Thursday, 7 October 1948, in the Chemistry Department of Leeds University, Mr. G. A. Jones delivered an Address on "High-Speed Photography", a summary of which is given below.

High-speed photography is used to investigate phenomena which happen in such a short period of time that the unaided eye is unable to see anything. During the last war such photographic techniques were used for a very large variety of purposes and our knowledge of those techniques was increased considerably. However, high-speed photography is no new thing and, as far back as 1872, Muybridge used photography to investigate the movement of men and animals. He is reported to have used 100,000 photographic plates in one year alone. Meanwhile, in this country, Capt. Abney set up a photographic section for the study of explosions at Shoeburyness in 1887.

It is logical to consider the making of high-speed still pictures before considering high-speed cinematography, since a cine film is merely a series of still pictures along a strip of celluloid. It is impossible to take single high-speed photographs by means of an ordinary camera shutter, because the inertia of even the lightest shutter blades is too great to enable them to open and close in the very short time available. Press photographers find a $1/10000$ second exposure short enough, and this can be attained by suitably designed mechanisms. In scientific work, however, we are concerned with operations which must be recorded in much shorter times—even as short as $1/1,000,000$ th of a second. In the early days of photography, this was attained by using the camera in a darkened room without any shutter over the lens and employing an electric spark to illuminate the subject for a very short time. It is possible to produce sparks with sufficient intensity and a

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duration of only about $1/1,000,000$ th second. Such sparks, however, give only enough light to provide silhouettes and in recent years we have therefore chosen to use high-speed flashes from gas discharge lamps in place of spark illumination.

The principle involved in the high-speed gas discharge lamp is the release of energy from a bank of condensers through a tube of rare gas at low pressure. For instance, a 112 m.f. condenser bank charged to 200 V. can be used to produce a flash having an intensity around 50,000,000 candle power and a duration of only $1/10,000$ th of a second. Such a light source is invaluable for recording machine parts in operation, the performance of athletes, animal movements, and scientific phenomena. It can be used in conjunction with other instruments, such as microscopes and polariscopes. Owing to the fact that an electronic switch is often used to operate such lamps, they can be triggered by means of a low tension external circuit. In this way it is easy to trip them off at the right instant by means of brush contacts on a machine, photo-electric cells, microphones, and other methods.

High-speed cine films can be taken by means of a series of flashes from lamps of this sort, but it is difficult to provide sufficient illumination at a high rate of flashing owing to the large dissipation of energy involved. The ordinary cine camera runs intermittently—the film is pulled down by means of a claw in between one exposure and the next, but the film remains stationary during the period of exposure. This mechanism is quite feasible at speeds up to about 200 per second, but above that the film is not sufficiently robust to be able to stand intermittent motion. It is therefore necessary for the film to run continuously through the camera. With a flashing light system, this is feasible if the exposure time is sufficiently short to prevent any blurring due to the movement of the film as well as that due to the movement of the object. Since this is difficult to achieve, however, it is more usual to employ a system of optical compensation for the movement of the film during exposure. In some cameras, notably the Vinten, this takes the form of a ring of lenses which rotates at the front of the camera so that each lens in turn moves downwards with the film at the same speed, and the image cast by the lens rests on the film during the period of exposure without any relative movement. In the Kodak high-speed camera, however, lightness and compactness are achieved by means of 16 mm. film with a single taking lens. The compensation is carried out by means of a block of optical glass which rotates between the lens and the film, refracting the image downwards as it turns, so that the velocity of the image is equal to the velocity of the film and again there is no relative movement between the two.

16 mm. films produced in this way show a high degree of slow motion, owing to the high taking speed. The top speed of such cameras is around 3000 pictures per second—a slowing down when projected on a screen of about 200 times compared with normal. Films are, however, not always projected, but may be examined picture by picture so that displacement can be plotted against time. To enable this to be done accurately, a time base is fitted to the Kodak camera which gives a series of dots along the edge of the film, each pair of dots representing a time displacement of $1/1000$ th of a second. In many cases, the object itself does not move in such a way as to be easily photo-

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graphed, and an indicator such as a dial gauge or a spot of light has to be photographed for the purposes of motion analysis. Such films have been used for the studying of drop forging hammers, packing machines, bolt-making machines, and many other types of equipment in industry and in the armed forces.

Some Recent Lines of Metallurgical Development

At the meeting of the Society held on Thursday, 4 November 1948, in the Chemistry Department of Leeds University, an official visit was paid by the President (Sir Arthur Smout) and the Secretary (Lieut.-Colonel S. C. Guilan) of the Institute of Metals, who were welcomed by the Chairman. Sir Arthur Smout thanked the Chairman for his welcome, and briefly addressed the members of the Society.

Dr. R. Genders, M.B.E., then read a paper on "Some Recent Lines of Metallurgical Development", in which he dealt with improved alloys; the conservation of strategic metals and substitution; and the rationalization of specifications. Dr. Genders then discussed the mass effect of hardenability; the development of isothermal heat-treatment; automatic large-scale heat-treatment; and internal stress and applications of peening processes. Finally, he gave some results of current studies of extrusion flow and the development of modified methods.

LONDON LOCAL SECTION

Resources of Strategic Metals

The Section paid its annual visit to the Royal School of Mines on Thursday, 11 November 1948, when Professor W. R. Jones, C.B.E., D.Sc., M.I.M.M., delivered an address on "Resources of Strategic Metals".

He said that no country in the world has sufficient resources of all the minerals required to supply it even in normal times with the metals and non-metals it needs. Some countries are more fortunate in this respect than others, but even the most favoured in its mineral resources is dependent for some essential mineral products on supplies from outside its own boundaries. This is true not only of every country but also of every nation.

This is not surprising when we consider that only about 1% of the earth's surface is known to cover deposits of minerals in economic quantities, that these deposits are extremely diverse, that some are confined to but few parts of the earth, that their occurrence is the result of geological not geographical factors, that once a deposit is exhausted there is no second crop, and that during the last 40 years a greater variety and larger tonnages have been worked than throughout the whole of the previous history of mining.

The minerals and mineral products which are essential to a country's industries, and which are not, and cannot be, produced in that country in sufficient quantity to satisfy its demand, can be conveniently referred to as "strategic minerals" and the metals derived from them as "strategic metals". There is not, for example, a single tin mine in the whole of the U.S.A. and Canada. Tin for those countries is a highly strategic metal.

In normal times before World War II, Germany imported about

half-a-million tons annually of manganese ore. Her domestic production was very small and the only important source of manganese in the countries she occupied in Europe during hostilities was in Czechoslovakia, which, however, could only supply Germany with less than a twentieth of her war requirements. When Germany retreated from the U.S.S.R. and had to abandon the long salient which encompassed Nikopol, the largest manganese field in the world, her production of steel soon dropped to less than 30% of what it was in 1943.

With the single exception of the U.S.S.R., all the major industrial countries are markedly deficient in domestic deposits of chromite, the only mineral source of chromium. The U.S.A., the largest user, normally produced less than 1% of its consumption, and Great Britain has virtually no chromite ore occurrences. Germany built up a large stock-pile of chromite during the five-year period before 1939. She also accumulated vast quantities of the tungsten mineral, wolfram, during that period, but not sufficient for a long war—so that she had to turn to Portugal and Spain. So acute became her shortage of tungsten that her agents were offering in 1944 between £6000 and £10,000 per ton for wolfram which normally was priced at between £200 and £300 per ton.

Professor Jones dealt with other mineral shortages, his object being to show that if mineral sanction had been imposed on Germany during the five-year period before 1939, allowing her to import only her needs for normal industrial purposes, she could not have accumulated the essential metals for her armaments and World War II could thus have been prevented.

The scramble for minerals before and during emergencies emphasized how extremely restricted in their geographical distribution are certain strategic minerals, even some which are of outstanding importance. All the world's natural cryolite, the chief flux in the extraction of aluminium, is obtained from one hole in the ground at Ivigtul, in West Greenland—a hole not as large as one comparatively small Cornish china-clay pit. More than three-quarters of the world's molybdenum come from Climax in Colorado, and over 80% of the world's nickel from Sudbury, in Ontario.

Before 1923 the chief source of uranium and radium were the carnotite deposits of Colorado and Utah; then came the discovery of the rich uraninite deposits of the Belgian Congo which, by 1929, surpassed in production those of the U.S.A. Following the discovery in 1930 of the wonderful pitchblende deposits of the Great Bear Lake in North-West Territories, Canada joined Belgium as the world's chief producers of radium and uranium. The famous Joachimsthal pitchblende ores in Czechoslovakia supplied small quantities before World War II and are now being worked most actively under Soviet control. For some years before 1939 the small production of uranium ores in Portugal and in Cornwall had ceased. The only other known sources where uranium minerals were being worked, and that on a very small scale, were in Madagascar; at Mount Painter in South Australia; and the deposits in Russian Turkestan where the rare mineral, tyuyaminite, occurs.

That, in outline, was the position regarding the known workable and marginally commercial occurrences of uranium ores up to the year 1940, before the enormous potentialities of uranium as a source of atomic energy had been realized. Uranium may

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become as valuable as gold, so that deposits once considered to be too low-grade to be of use will become valuable sources of the metal. It would seem that we are on the threshold of the time when even ultra-low-grade deposits of uranium and of thorium, such as occur in many parts of the world, will come under control of Governments, large and small, as reserves of the raw material for the generation of power. In the Ucta region of the U.S.S.R. new sources of radium and mesotherium have been found where these metals are now being extracted from the natural waters in which they occur in solution.

MANCHESTER METALLURGICAL SOCIETY

A Joint Meeting of the Institute of Metals and the Manchester Metallurgical Society was held at the Engineers' Club, Albert Square, Manchester, on Wednesday, 3 November 1948, the President, Sir Arthur Smout, J.P., taking the Chair. Dr. N. P. Allen, M.Met., Superintendent of the Metallurgy Division of the National Physical Laboratory, delivered a most interesting address on

Metallurgical Research at the National Physical Laboratory

Dr. Allen gave a brief description of the use of the electron microscope in the study of steel, the application of the Geiger counter to the X-ray examination of metals in work on the transformations in pure iron-nickel alloys. He showed how faith in the reliability of the surface replicas used in the electron microscopy of metals has been developed by comparisons between electron micrographs, ordinary micrographs, and micrographs taken with the phase contrast reflecting microscope. The structures of quenched and tempered steels as revealed by the electron microscope were touched upon. The lecturer then described the operation of the Geiger counter and the measurement of X-ray line breadths to show whether a stabilizing treatment had been given to a hardened gauge steel. The results of experiments on the rate of formation of gamma-iron in iron-nickel alloys heated to temperatures of 500°-700° C. were given and the influence of nickel content and temperature were discussed. Some views on the factors affecting the rate of nucleation were expressed.

SOUTH WALES LOCAL SECTION

Controlled Atmospheres in the Non-Ferrous Industry

Mr. Ivor Jenkins, M.Sc., A.I.M., gave an address before the Section on Tuesday, 2 November 1948, at University College, Singleton Park, Swansea, his subject being "Controlled Atmospheres in the Non-Ferrous Industry".

He gave an outline of the physical chemistry underlying the application of controlled atmospheres to the heat-treatment of non-ferrous metals and underlined the importance of chemical equilibrium data and the dissociation pressures of metallic oxides. These principles were illustrated by reference to practical examples, e.g. the bright-annealing of copper and nickel alloys, and the embrittlement of tough-pitch copper.

Various types of controlled atmosphere generators in use in this country were described and their broad fields of application out-

lined. These included atmospheres derived from ammonia, hydrocarbon gases, and charcoal.

Finally, Mr. Jenkins referred to current research and development work in this field, especially with regard to the bright-annealing of brass, metal-coating processes, properties of metal surfaces, and the effect of controlled atmospheres on the performance and life of heat-resisting furnace parts.

JOINT ACTIVITIES

NATIONAL CERTIFICATES IN METALLURGY

Year 1947-1948

Prizes have been awarded to the following candidates in respect of the Final Examinations for Ordinary and Higher National Certificates in Metallurgy.

Battersea Polytechnic, London: Betts, John William George (£2 2s.); Fricker, Dennis John (£1 1s.). *Birmingham Central Technical College*: Lloyd, Raymond Charles (£3 3s.); Smith, Donald Norman (£2 2s.). *Chesterfield Technical College*: Bonsall, Peter (£1 1s.); Burrows, Alwyne George (£5 5s.); Havenhand, William (£1 1s.). *Cumberland Technical College, Workington*: Jackson, Leslie (£1 1s.); Tate, Reginald (£5 5s.). *Newport Technical College, Mon.*: Oliver, Kenneth Arthur (£4 4s.). *Rotherham College of Technology*: Stevens, Malcolm (£2 2s.). *Smethwick, The Chance Technical College*: Turner, Geoffrey Royston (£1 1s.). *Rugby College of Technology*: Ashton, Geoffrey (£2 2s.). *Swansea Technical College*: Cumming, John Baker (£1 1s.); Evans, Leslie George (£1 1s.). *Wednesbury, County Technical College*: Lycett, Willis Frederick (£1 1s.). *Wolverhampton and Staffordshire Technical College*: Cartwright, Harry (£1 1s.).

OTHER NEWS

FOURTH EMPIRE MINING AND METALLURGICAL CONGRESS, GREAT BRITAIN, JULY 1949

Response to First Circular

The response to the First Circular has been somewhat greater than was originally expected and it may be necessary to reserve additional accommodation. Members who have not yet completed and returned Form "A" of the Circular are requested to do so as soon as possible, so that reservations may be made in accordance with their wishes.

The second and subsequent circulars will be sent *only* to those who have replied to the First Circular.

Correspondence should be addressed to The General Secretaries, Fourth Empire Mining and Metallurgical Congress, 436 Salisbury House, Finsbury Circus, London, E.C.2.

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THE INSTITUTION OF METALLURGISTS

Examinations 1948.—Pass List

The Institution's examinations were held from 6 to 13 September 1948, at Birmingham, Glasgow, and London.

*Licentiate*ship : Hoare, Hubert Arthur (Oxford); Lloyd, Raymond Charles (Birmingham); Mills, Raymond (London); Stuttard, Arthur (Burnley).

*Associate*ship : Bergmann, Josef (Corby); Blackburn, Jack (Huddersfield); Brown, James Albert (Wallsend-on-Tyne); Gainsbury, Peter Edward (Harrow); Graham, John Alastair (Slough); Hutchings, Felix Roy (Bedford); Kersting, Philip Eric (Corby); Miles, John Joseph (Liverpool); Perry, Edwin Reginald (High Wycombe); Robertson, Thomas (Kilmarnock).

The following candidates satisfied the Examiners in the Associateship examination, but their election to the grade of Associate is deferred pending their attaining the age of 25 years: Clark, Edwin Brian (Coventry); Jones, Gordon Vincent (Llanely).

ENGINEERING AND MARINE EXHIBITION, 1949

The Engineering and Marine Exhibition will be held at Olympia, London, W.14, from 25 August to 10 September 1949. Particulars of space, &c., may be obtained from the organizers, Messrs. F. W. Bridges and Sons, Ltd., Grand Buildings, Trafalgar Sq., London, W.C.2.

WORLD ENGINEERING CONFERENCE

The World Engineering Conference has been granted consultative status by Unesco.

The Conference, thus recognized as a channel of international contact between engineers, will be entitled (subject to Article IV E of the constitution of Unesco) to send observers to the General Conference of Unesco and may be invited to participate in expert meetings or technical conferences, or in advisory committees, on subjects falling within their field of interest, and to work with Unesco in all such activities as that organization may consider to be mutually advantageous in carrying out their programme.

NATIONAL PHYSICAL LABORATORY

N.P.L. "Open Days" will be held in 1949 on Thursday, 26 May, for representatives of industrial organizations, and on Friday, 27 May, for members of university staffs and Government departments.

COMMONWEALTH FUND FELLOWSHIPS

The Commonwealth Fund of New York, a philanthropic foundation existing since 1918 and supported by endowment from the late Mrs. Stephen V. Harkness and the late Mr. Edward S. Harkness, has established for British subjects a number of Fellowships tenable in the United States. The Fellowships are under the patronage of the King.

Ordinary Fellowships are open to candidates who (a) are over 23 and under 35 years of age on 1 September of the year of award, and (b) have not worked or studied in any educational or research

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establishment in the U.S.A. for one or more academic years. Candidates who are domiciled in the U.K. and Northern Ireland must be graduates of a recognized university therein; those not so domiciled must be graduates of a recognized university in Australia, New Zealand, or South Africa. Twenty Ordinary Fellowships will be offered in 1949.

Particulars of the conditions of appointment and tenure and of the emoluments attached to these Fellowships may be obtained from the Secretary, Commonwealth Fund Fellowships, 35 Portman Sq., London, W.1.

DIARY FOR JANUARY

LOCAL SECTIONS MEETINGS

THURSDAY, 6 JANUARY

Birmingham Local Section.—E. H. Bucknall: "Metals in Instruments". (James Watt Memorial Institute, Great Charles St., Birmingham, at 6.30 p.m.)

London Local Section.—Dr. E. Voce: "A Modern Commentary on Copper and its Alloys". (4 Grosvenor Gardens, London, S.W.1, at 7 p.m.)

TUESDAY, 11 JANUARY

South Wales Local Section.—Films of Metallurgical Interest. (University College, Singleton Park, Swansea, at 6.30 p.m.)

MONDAY, 17 JANUARY

Scottish Local Section.—Visit to the Engineering and Physical Laboratories of Glasgow University. (Assemble at the Main Gate of the University, on the summit of University Avenue at 2.30 p.m.)

FRIDAY, 21 JANUARY

Sheffield Local Section.—R. C. Jewell: "Thermocouples". (Grand Hotel, Sheffield, at 6.30 p.m.)

OTHER MEETINGS

TUESDAY, 4 JANUARY

Electrodepositors' Technical Society, Midlands Centre.—Dr. T. H. Nelson: "Physical Deposition of Metals and Other Coatings". (James Watt Memorial Institute, Great Charles St., Birmingham 3, at 6.30 p.m.)

WEDNESDAY, 5 JANUARY

Institute of British Foundrymen, Birmingham Branch.—Details to be announced later. (Chamber of Commerce, New St., Birmingham.)

THURSDAY, 6 JANUARY

Leeds Metallurgical Society.—E. J. Vaughan: "Modern Techniques in Non-Destructive Testing". (Chemistry Dept., The University, Leeds 2, at 7 p.m.)

Liverpool Metallurgical Society.—Sir Charles Goodeve, O.B.E., F.R.S.: "The Steel-Making Process". (Grosvenor Museum, Chester, at 7 p.m.)

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SATURDAY, 8 JANUARY

Institute of British Foundrymen, Newcastle Branch.—Branch President's night. (Neville Hall, Newcastle-on-Tyne, at 6 p.m.)

Institute of British Foundrymen, West Riding of Yorkshire Branch.—Prize-winning paper in S. W. Wise Memorial Competition. (Technical College, Bradford, at 6.30 p.m.)

MONDAY, 10 JANUARY

Institute of British Foundrymen, Sheffield Branch.—R. L. Lee: "Do You Use Your Cost System?" (Royal Victoria Hotel, Sheffield, at 7.30 p.m.)

TUESDAY, 11 JANUARY

Institute of British Foundrymen, Slough Section.—H. W. Keeble and — Caven: "Some Special Examples of Light Alloy Founding". (Lecture Theatre, High-Duty Alloys, Ltd., Slough, at 7.15 p.m.)

Institute of Marine Engineers.—J. Rhodes, T. H. Arnold, and J. R. Rait: "Methods of Non-Destructive Testing of Large Marine Forgings and Castings". Joint meeting with Institution of Naval Architects. (85-88 The Minories, London, E.C.3, at 5.30 p.m.)

Institution of Engineers and Shipbuilders in Scotland.—J. M. A. Lenihan: "Nuclear Physics and the Engineer". (39 Elmbank Crescent, Glasgow, C.2, at 6.30 p.m.)

WEDNESDAY, 12 JANUARY

Institute of British Foundrymen, Lancashire Branch.—D. Killingworth: "The Venting of Cores and Moulds". (Engineers' Club, Albert Sq., Manchester, at 7.0 p.m.)

Institution of Structural Engineers, Northern Counties Branch.—S. M. Reisser: "Further Examples of Welded Structures". (Gas Demonstration Room, St. John St., off Grainger St., Newcastle-on-Tyne, at 6.30 p.m.)

Newcomen Society.—S. Morley Tonkin: "Trevithick, Rais-trick, and the Hazledine Foundry, Bridgnorth". (Institution of Mechanical Engineers, Storey's Gate, Westminster, London, S.W.1, at 5.30 p.m.)

THURSDAY, 13 JANUARY

Institute of British Foundrymen, Lincoln Section.—E. A. Phillips: "Some Problems of a Small Jobbing Foundry". (Technical College, Lincoln, at 7.15 p.m.)

Institute of Welding, South London Branch.—E. Seymour Semper: "New Methods of Oxygen Cutting Stainless Steels". (Institute of Marine Engineers, 85-88 The Minories, London, E.C.3, at 6.30 p.m.)

Institution of Structural Engineers, Northern Counties Branch.—S. M. Reisser: "Further Examples of Welded Structures". (Cleveland Scientific and Technical Institution, Corporation Rd., Middlesbrough, at 6.30 p.m.)

NEWS AND ANNOUNCEMENTS

FRIDAY, 14 JANUARY

Institute of British Foundrymen, Middlesbrough Branch.—L. Johnson: "The Production of Basic Electric Steel for Castings". (Cleveland Scientific and Technical Institute, Corporation Rd., Middlesbrough, at 7.30 p.m.)

SATURDAY, 15 JANUARY

Institute of British Foundrymen, Birmingham Branch (Students' Section).—Visit to the works of the Incandescent Heat Co., Ltd., Smethwick, at 9.30 a.m.

MONDAY, 17 JANUARY

Electrodepositors' Technical Society.—Dr. J. Pearson: "The Porosity of Metallic Coatings on Steel Base". (Northampton Polytechnic, St. John St., Clerkenwell, London, E.C.1, at 5.30 p.m.)

WEDNESDAY, 19 JANUARY

Geological Society of London.—Ordinary Evening Meeting. (Burlington House, Piccadilly, London, W.1, at 5 p.m.)

Institute of Welding, West of Scotland Branch.—C. C. Macfarlane: "Stud Welding". (39 Elmbank Crescent, Glasgow, C.2, at 6.45 p.m.)

Manchester Metallurgical Society.—J. I. Morley: "Metallography of Stainless and Heat-Resisting Steels". (Engineers' Club, Albert Sq., Manchester, at 6.30 p.m.)

THURSDAY, 20 JANUARY

Electrodepositors' Technical Society, Midlands Centre.—Annual Dinner and Dance. (Botanical Gardens, Edgbaston, Birmingham, at 6.30 for 7 p.m.)

Institute of Welding, North London Branch.—Presidential Address. (Polytechnic, Regent St., London, W.1, at 7.30 p.m.)

Institution of Mining and Metallurgy.—General Meeting. (Geological Society, Burlington House, London, W.1, at 5 p.m.)

FRIDAY, 21 JANUARY

Institute of British Foundrymen, Falkirk Section.—A. L. Mortimer: "Core Shop Practice". (Temperance Café, Lint Riggs, Falkirk, at 7 p.m.)

West of Scotland Iron and Steel Institute.—I. M. Mackenzie: "A Statistical Investigation of Cracking in Basic Open-Hearth Ingots". (39 Elmbank Crescent, Glasgow, C.2, at 6.45 p.m.)

SATURDAY, 22 JANUARY

Institute of British Foundrymen, Bristol Branch.—W. H. Hornby: "Loam Moulding". (Grand Hotel, Broad St., Bristol, at 3 p.m.)

Institute of British Foundrymen, Burnley Section.—R. Yeoman: "A Day in the Foundry". (Grammar School, Blackburn Rd., Accrington, at 6.15 p.m.)

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MONDAY, 24 JANUARY

Electrodepositors' Technical Society, Sheffield and North-East Centre.—A. E. Nicol: "Mechanism of Electrolysis". (Grand Hotel, Sheffield, at 6.30 p.m.)

WEDNESDAY, 26 JANUARY

Institute of British Foundrymen, London Branch.—G. L. Harbach: "Synthetic Resin Core Binders". (Waldorf Hotel, Aldwych, London, W.C.2, at 7.30 p.m.)

Institute of Welding.—Sir William J. Larke Medal Paper. (Institution of Civil Engineers, Great George St., London, S.W.1, at 6 p.m.)

FRIDAY, 28 JANUARY

Chemical Society.—Dr. R. P. Linstead, C.B.E., F.R.S.: "Some Aspects of Recent Work at the Chemical Research Laboratory, Teddington". Joint meeting with the Southampton University College Chemical Society. (Physics Dept., University College, Southampton, at 5 p.m.)

Institute of British Foundrymen, Birmingham Branch.—Annual Dinner and Dance. (Botanical Gardens, Edgbaston, Birmingham.)

Institute of British Foundrymen, West Wales Section.—J. D. T. Yuille: "The Production of High Quality Castings". (Baldwin's Canteen, Landore Works, Swansea, at 7 p.m.)

SATURDAY, 29 JANUARY

Institute of British Foundrymen, East Midlands Branch.—D. Killingworth: "Venting of Cores and Moulds". (Loughborough College, at 6 p.m.)

Institute of British Foundrymen, Wales and Monmouth Branch.—"Aluminium Castings Production". Film produced by High Duty Alloys, Ltd., and presented by the Aluminium Development Association. (Engineers' Institute, Cardiff, at 6 p.m.)

APPOINTMENTS REQUIRED

To conform to the requirements of the Control of Engagements Order, 1947, these advertisements are published for the information only of those who are "excepted persons" under the Order.

ALUMINIUM INDUSTRY. Man, capable, trained Laboratory and Drawing Office, 20 years' service, available shortly owing to plant shut-down. Experienced technical research, liaison work, chief inspector, labour supervision, plant development. Salary £550. Would go abroad. Capital available. Box No. 249, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

METALLURGIST, B.Sc. (Hons.), A.I.M., 28, seeks position as development metallurgist, involving customer contact on technical problems and new applications of materials, at home and abroad. Experience in research and works. Ferrous and non-ferrous. Good appearance and personality. London district preferred. Box No. 250, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

THE INSTITUTE OF METALS

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Assistant Editor :

Major W. G. ASKEW, M.C.

Assistant Secretary :

Major R. E. MOORE

Administrative and Editorial Offices :

4 GROSVENOR GARDENS, LONDON, S.W.1

Telephone :

SLOANE 6233

A NEW YEAR MESSAGE FROM THE PRESIDENT

It has been customary for several years past for the President to send to his fellow members a New Year message for publication in the January issue of the *Journal*. It is my privilege to continue the precedent, now I believe, well established.

In my Presidential Address I pointed out the debt members owe to the men of an earlier generation who did so much to place the Institute on so sound a footing. The New Year is a time for looking forward as well as an occasion when we review the past.

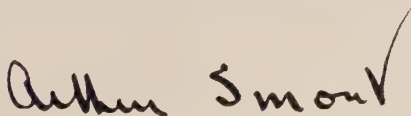
This Institute over the years has established itself firmly as the accredited learned society of the Non-Ferrous Metals Industry ; it is as world-wide in its membership as in its interests, and can contribute much not only in the collection and dissemination of knowledge, but also towards the well-being of mankind. Progress is essentially a cumulative process ; we build our work on the foundations established by our forebears.

The question I want to ask myself on the opening of another year and to put fairly and squarely before my fellow members is : " Are we making that same personal contribution to the well-being of the Institute as was made by the founder members, on whom Time has taken so heavy a toll ? What are we doing to enhance its prestige and standing throughout the world ? "

The measure of service which the Institute can render is directly proportional to the support it receives from each and every member. All said and done, the members are the Institute !

I venture to suggest that our Institute has greater opportunities to-day than ever in its history, and I believe we are going to make the most of them. This is a challenge which we are in honour bound to take up by making the fullest use of the opportunities our founders have given us. We should regard membership of the Institute as a privilege and participation in its affairs as a duty of which to become increasingly proud.

With these cardinal objectives before us we shall go on from strength to strength.



INSTITUTE NEWS AND ANNOUNCEMENTS

COUNCIL VACANCY

In accordance with Article 28, the Council has appointed Mr. H. W. G. HIGNETT, B.Sc., Superintendent of the Development and Research Department Laboratory of The Mond Nickel Company, Ltd., Birmingham, to be an Ordinary Member of Council in place of Dr. B. Chalmers, who retired on leaving England to take up an appointment in Canada.

Mr. Hignett's term of office expires, in accordance with Article 28, at the Annual General Meeting, which is to be held in London from 30 March to 1 April 1949.

The Council nominates Mr. Hignett for re-election with effect from the 1949 Annual General Meeting, and, unless any other candidate or candidates are put forward by members, in accordance with Article 23(a) he will be deemed to be duly elected at that Annual General Meeting.

Members are reminded that, under Article 22, any ten members may also nominate, in writing, with the consent to act if elected of the person nominated, any duly qualified person other than one nominated by the Council to fill this vacancy on the Council. Such nomination must be handed to the Secretary before the conclusion of the Annual General Meeting at 1 p.m. on Friday, 1 April 1949.

SYMPOSIUM ON TECHNIQUES OF METALLURGICAL INVESTIGATIONS, BIRMINGHAM, 18 FEBRUARY 1949

The attention of members is directed to this whole-day Symposium which is being organized by the Birmingham Local Section, at the Chamber of Commerce, New Street, Birmingham. Particulars are given on p. 66.

ANNUAL GENERAL MEETING, LONDON 30-31 MARCH AND 1 APRIL 1949

The Annual General Meeting will be held on Wednesday and Thursday, 30 and 31 March, at the Institution of Mechanical Engineers, Storey's Gate, London, S.W.1, and Friday, 1 April, at 4 Grosvenor Gardens, London, S.W.1. A detailed programme will be sent to all members shortly.

On the morning of 30 March the Reports of the Council and of the Honorary Treasurer will be presented, the Institute of Metals (Platinum) Medal for 1949 will be presented, and two papers will be discussed; in the afternoon two more papers will be presented and discussed.

A Symposium on "Metallurgical Aspects of Non-Ferrous Metal Melting and Casting of Ingots for Working" will be held during the whole of Thursday, 31 March, based on six papers which are published in this issue of the *Journal*.

In the evening a dinner-dance will be held at the Savoy Hotel, Strand, W.C.2, tables for which can now be booked. (Tickets, single 31s. 6d.; double £3 3s.) A Carroll-Gibbons band has been engaged, and dancing will continue until 1 a.m.



REPRODUCTION OF A WATER-COLOUR DRAWING, BY HENRY RESHURRY, R.A.,
OF 4 GROSVENOR GARDENS, LONDON, S.W.1

This building—one half of which is partly obscured by a tree in the picture—contains the headquarters of the Iron and Steel Institute and the Institute of Metals, and their Joint Library.

NEWS AND ANNOUNCEMENTS

The meeting will be concluded on the morning of Friday, 1 April, at 4 Grosvenor Gardens, S.W.1, when two papers will be presented and discussed.

Buffet lunches will be served, for the convenience of members, on Wednesday and Thursday, 30 and 31 March.

It is hoped that there will be a large attendance at this meeting, including many members and delegates from overseas.

STUDENTS' EDUCATIONAL TOUR

All Associate Members and Student Members should have received a circular letter and reply form in connection with the educational tour for Student Members which has been arranged to be held in Birmingham from 4 to 8 April, inclusive.

MAY LECTURE

SIR EDWARD APPLETON, G.B.E., K.C.B., M.A., D.Sc., LL.D., F.R.S., has accepted the Council's invitation to deliver the 1949 May Lecture in London on the evening of Wednesday, 25 May.

SYMPOSIUM ON THE ELECTRON MICROSCOPE

The Institute will hold a one-day Symposium on "Metallurgical Applications of the Electron Microscope" in London in November 1949. Full particulars will be published as early as possible.

THE W. H. A. ROBERTSON MEDAL AND PREMIUM

Members are reminded of the generous offer made by Messrs. W. H. A. Robertson and Company, Ltd., of Bedford, to give the sum of £100 per annum, for a period of at least seven years, to provide an award or awards to authors of papers dealing with the engineering side of non-ferrous metallurgy.

This offer was accepted by the Council with much gratitude, and it has been agreed with the donors that each award shall consist of a bronze medal (3-in. diameter) and premium.

The Council hopes that the generous action of the donors will stimulate the writing of the type of papers which they had in mind.

Terms of Award

The W. H. A. Robertson bronze medal and premium, presented by Messrs. W. H. A. Robertson and Company, Ltd., shall be awarded annually by the Council of the Institute of Metals to the author or authors of the paper adjudged to be of the highest merit contributed to the *Journal of the Institute of Metals* on engineering aspects of non-ferrous metallurgy. No award shall be made in any year when the Council is satisfied that no paper has been published which is of such merit as to justify the award.

Periods Covered by the Awards

For the first award the Medal Committee will consider papers published in the Institute's *Journal* from March 1948 to August 1949, inclusive. Thereafter, unless revised at the discretion of the Council, the annual award will be made in respect of papers published in the *Journal of the Institute of Metals* covering the annual issues from September to August, inclusive.

NEWS AND ANNOUNCEMENTS

CAPPER PASS AWARDS

In 1947, the Directors of Messrs. Capper Pass and Son, Ltd., Bristol, sharing the regret which had been expressed in many quarters at the dearth of papers on processes and plant used in extraction metallurgy in the *Transactions of the Institution of Mining and Metallurgy*, and of papers on processes and plant used in the fabrication of non-ferrous metals in the *Journal of the Institute of Metals*, offered to these Institutions the sum of £200 per annum for a period of seven years to be applied as follows :

(a) £100 per annum to be available for one or more awards to the authors of papers on some aspect of non-ferrous extraction metallurgy ;

(b) £100 per annum to be available for one or more awards to the authors of papers relating to some process or plant used in the extraction or fabrication of non-ferrous metals,

contributed by persons engaged full time in industry or practice.

The Councils of the Institution of Mining and Metallurgy and of the Institute of Metals gratefully accepted this offer, and appointed a joint Adjudicating Committee. This Committee has power to make the awards on behalf of the two societies and may, at its discretion, make no award or awards of less than the money available if, in its opinion, the quality or number of papers submitted in any year fails to reach a suitable standard. Any sums not awarded will be carried forward to future years.

The Councils of the Institution of Mining and Metallurgy and of the Institute of Metals hope that the generous offer made by Messrs. Capper Pass and Son, Ltd., will stimulate the writing of many papers of the types for which the awards are to be made. Papers on extraction metallurgy should preferably be submitted to the Institution of Mining and Metallurgy, while those on processes and plant used in the fabrication of non-ferrous metals should preferably be offered to the Institute of Metals. Both societies are prepared to accept papers of suitable quality from non-members.

Authors should note that applications should not be addressed to the Adjudicating Committee requesting that their papers should be considered for an award. All papers published by both societies will be examined by the Committee annually, and notices of the awards will be published in the journals of the two societies and in the Press. The Committee will shortly consider all papers published by the two societies during 1948.

REPRESENTATION OF THE INSTITUTE

The Council has appointed Colonel Sir Paul Gueterbock, K.C.B., D.S.O., M.C., T.D., D.L., J.P., M.A., A.D.C., Mr. H. W. L. Phillips, M.A., and The Hon. R. M. Preston, D.S.O., to be the official delegates of the Institute to the Fourth Empire Mining and Metallurgical Congress, which is to be held in Great Britain in July 1949.

NEWS AND ANNOUNCEMENTS

PERSONALITIES

COLONEL SIR PAUL GUETERBOCK

Colonel Gueterbock, who, in the New Year's Honours List, received the honour of Knighthood of the Most Honourable Order of the Bath, was a Member of Council of the Institute from 1940 to 1943, a Vice-President from 1943 to 1946, and President from 1946 to 1948. On behalf of the members we offer him our hearty congratulations on this high honour bestowed on him in recognition of so many years devoted to public service.

Born in 1886, and educated at Rugby (Scholar) and Trinity College, Cambridge (Scholar), at which he was a student of Mr. C. T. Heycock, Sir Paul joined Messrs. Capper Pass and Son, Ltd., tin and lead smelters, in 1909. He worked from 1909 to 1914 on the constitution of antimony-tin-lead alloys, and since 1919 has developed and invented new processes for the recovery and refining of tin, and has published various scientific and technical papers on tin and tin alloys.



In 1924 he was appointed a Director of the firm and became Managing Director in 1937. He is also Chairman of Victor G. Stevens, Ltd., Gateshead; Chairman of Geo. Pizey and Son, Ltd., London; Chairman of the British Smelters Association; and a Member of Council of the British Non-Ferrous Metals Research Association.

Since his youth, Sir Paul has set a very high example of devotion to the duties of citizenship and to public work, and the great services that he has rendered to the nation have been recognized in the honours that have been bestowed on him.

In 1907 he was commissioned as a 2nd Lieut. in the Cambridge University Rifle Volunteers. He transferred in 1909 to the 4th Bn., The Gloucestershire Regiment and served with this Battalion and in various staff appointments in France during the European War of 1914-1918, being mentioned in despatches and awarded the D.S.O. and M.C. He commanded the 4th Gloucesters from 1924 to 1929, when he was promoted Colonel on the General List of the Territorial Army. He is Chairman of the Gloucestershire Territorial and Auxiliary Forces Association, and County Army Welfare Officer for Gloucestershire. One of his recreations is rifle shooting; he captained the Rugby and Cambridge University teams, and was Chairman of the Gloucestershire County Rifle Association from 1923 to 1934.

In 1943 he received the honour of Companion of the Most Honourable Order of the Bath (C.B.), he is a Justice of the Peace, in 1946 was appointed a Deputy Lieutenant for the County of Gloucestershire, and in 1947 was appointed an A.D.C. (additional) to H.M. The King. He is a Member of Council of the Institution

NEWS AND ANNOUNCEMENTS

of Mining and Metallurgy and a Fellow of the Institution of Metallurgists.

MR. H. W. G. HIGNETT, B.Sc.

Mr. Hignett, who has been elected an Ordinary Member of Council to fill a casual vacancy arising through the resignation of Dr. Bruce Chalmers, was elected a Member of the Institute in 1930, and served on the Council from 1942 to 1946. Born in 1905, Mr. Hignett was educated at Bury Grammar School and decided on a chemical career. He, however, became an engineer by *force majeure* and a metallurgist by accident, in due course obtaining an external degree at London University.

After seven years as a metallurgist with Messrs. C. Walmsley and Co., Ltd., of Bury, Lancashire, he joined the Aluminium Plant and Vessel Co., Ltd., London, in 1930, and became an acknowledged authority on welding processes. At the end of ten happy years with this Company, under Dr. Richard Seligman, he joined the Development Section of the Research and Development Department of The Mond Nickel Co., Ltd., transferring in August 1945 from the Development to the Research Section. He is now Superintendent of the Development and Research Department Laboratory of The Mond Nickel Company, Ltd., Birmingham.



PERSONAL NOTES

DR. FRANK ADCOCK, M.B.E., has accepted an appointment to take charge of research for the Broken Hill Proprietary Company, Ltd.

MR. R. R. BRICKNELL has taken up an appointment as a metallurgical engineer with Vandervell Products, Ltd., Acton, London, W.3.

MR. T. BROOM, B.A., has been awarded a Goldsmiths' Dominions Travelling Scholarship and will be working for two years, under the direction of Dr. W. Boas, in the Division of Tribophysics, Council for Scientific and Industrial Research, Melbourne University.

MR. RONALD BUTLER, B.Met., has taken up an appointment as Research Metallurgist at the B.S.A. Group Research Centre, P.O. Box 94, Sheffield. His new address is 60 Psalter Lane, Sheffield 11.

NEWS AND ANNOUNCEMENTS

MR. J. B. CARROLL, B.Sc., L.I.M., has left Manchester University and has taken up an appointment as Assistant Metallurgist with Birlec, Ltd., Tyburn Road, Birmingham 24.

MR. A. CIBULA, B.A., has been appointed an Investigator with the British Non-Ferrous Metals Research Association.

MR. G. E. CLAUSSEN, M.E., S.M., Chief Metallurgist of the Reid-Avery Co., Inc., Dundalk, Baltimore, Md., U.S.A., has been elected Vice-President of District No. 2 of the American Welding Society.

DR. HARRY P. CROFT, Ch.E., M.S.Met., former Director of Technical Control and Research for the Mid-Western Division of the Chase Brass and Copper Company, Inc., has been named Vice-President in charge of development of the Wheeling Bronze Casting Company, Moundsville and Wheeling, W.Va., U.S.A. A two-war veteran, Dr. Croft served as a Private in the 3rd Infantry Division in World War I, and was copper consultant in the Offices of Production Management and War Production, prior to being commissioned in the Cleveland Ordnance District, where he was chief of the industrial division. When he retired at the end of the war with the rank of Colonel, he returned to the Chase Brass and Copper Co., with which Company he was associated in many capacities, including Chief Metallurgist, for 26 years. Dr. Croft, who is a graduate of the Rensselaer Polytechnic Institute, received his degree of Ph.D. in Metallurgy from the Case Institute of Technology in 1942.

MR. G. H. DAVIES is now an Assistant Metallurgist at the Panteg Section of Richard Thomas and Baldwins, Ltd.

DR. C. H. DESCH, F.R.S. (Past-President and Fellow) has been elected an Honorary Member of the Société des Ingénieurs Civils de France.

COLONEL W. C. DEVEREUX was gazetted in the New Year's Honours List as a Commander of the Most Excellent Order of the British Empire (C.B.E.).

MR. F. C. EVANS, A.I.M., has resigned his position as General Manager of Langley Alloys, Ltd., of Slough, Bucks. Correspondence should be addressed to him at Crowhill, School Lane, Farnham Common, Bucks.

PROFESSOR N. P. GANDHI, M.A., B.Sc., A.R.S.M., D.I.C., M.I.M.M. (Honorary Corresponding Member to the Council for India), has been appointed Chairman of the Basic Non-Ferrous Metals Sectional Committee of the Indian Standards Institution, and also a representative of the Indian Institute of Metals on the Non-Ferrous Metals Industry Development Committee set up by the Government of India.

COLONEL P. G. J. GUETERBOCK, C.B., D.S.O., M.C., T.D., D.L., M.A., J.P., A.D.C., received the honour of Knighthood of the Most Honourable Order of the Bath, in the New Year's Honours List.

MR. M. K. HALDAR, M.Sc., has resigned the post of Research Officer in the Textile Machinery Corporation, Ltd., Belghurriah, West Bengal, and has joined the Fuel Research Institute, Dhanbad, India, of the Council of Scientific and Industrial Research under the Ministry of Research, Government of India, as Junior Scientific Officer.

NEWS AND ANNOUNCEMENTS

DR. M. HANSEN, formerly Director of Research of the Dürer Metallwerke A.G., Berlin, joined the Department of Metallurgical Engineering of the Illinois Institute of Technology, Chicago, Ill., U.S.A., in December 1947. In 1946-47 he was editor of the General Metallurgy and Non-Ferrous Metallurgy sections of the "F.I.A.T. Review of German Science, 1939-1946".

DR. S. L. HOYT, E.M., has been appointed a member of a new Committee on Ship Steel, of the U.S. National Research Council, Division of Engineering and Industrial Research.

MR. IVOR JENKINS, F.I.M., was recently awarded the degree of Doctor of Science of the University of Wales for work in the field of metallurgy.

MR. W. J. KLIMECKI, Dipl.Ing., has left the Royal College of Science and is now engaged in the Physics Department of the Institut Metalurgii (Institute of Metallurgy) in Gliwice, Poland. His private address is: Ul. Św. Anny 7, Kraków, Poland.

DR. JOHN R. LOW, Jr., has left the School of Mineral Industries, Pennsylvania State College, to join the General Electric Company at its Knolls Atomic Power Laboratory, 425 Peek Street, Schenectady, N.Y., U.S.A.

MR. ALEXANDER MCARTHUR, who last year resigned the Honorary Treasurership of the Birmingham Local Section, on moving from the district to represent a number of manufacturers in the Eastern Counties, is now acting as a consultant and agent at 310 Southbourne Grove, Westcliff-on-Sea, Essex. He continues his connection with the Electric Furnace Company, Ltd., as their representative in the Eastern Counties of England.

SIR ANDREW McCANCE, D.Sc., A.R.S.M., F.R.S., has been appointed a Vice-President of the Fourth Empire Mining and Metallurgical Congress.

MR. D. S. MCGREGOR, M.Sc.Tech., has been appointed Head of the Mechanical Engineering Department of the Nottingham and District Technical College, Shakespeare Street, Nottingham.

PROFESSOR R. F. MEHL, Ph.D., has been appointed Chairman of a new Committee on Ship Steel, of the U.S. National Research Council, Division of Engineering and Industrial Research, and also a member of the Advisory Committee to the Secretary of Commerce on the (U.S.) National Bureau of Standards.

MR. B. H. MORGAN, B.Sc., A.I.M., is now employed in the Metallurgical Department of Messrs. J. Stone and Company, Ltd., Deptford, London, S.E.14.

MR. A. MORRIS has been awarded the M.Sc. degree of the University of Wales and has taken up an appointment as Metallurgist with the Aluminium Wire and Cable Company, Ltd., Port Tennant Works, Swansea.

MR. K. RAE, M.Sc., F.R.I.C., F.I.M., has been appointed a Director in the Directorate General, Ministry of Industries and Supplies, 2 Shahjahan Road, New Delhi, India.

DR. G. V. RAYNOR, M.A., has been awarded the degree of D.Sc. of Oxford University.

MR. H. O. SMALDON is a member of the 1949 British Industries Fair Publicity Committee.

NEWS AND ANNOUNCEMENTS

SIR ARTHUR SMOUT, J.P., M.I.M.M., F.I.M. (President), has been appointed a Vice-President of the Fourth Empire Mining and Metallurgical Congress. He is also a Vice-President of the 1949 British Industries Fair.

MR. D. J. STRAWBRIDGE, B.Sc., has been awarded the degrees of M.A. and D.Phil. of Oxford University.

SIR GEOFFREY TAYLOR, F.R.S., has been appointed a member of a delegation from the Royal Society to attend the seventh Pacific Science Congress at Auckland and Christchurch, New Zealand, from 2 to 22 February.

MR. L. H. WILLIAMS, B.Sc., A.R.S.M., has left the employment of the Imperial Smelting Corporation, Ltd., to take up a post on the editorial staff of Industrial Newspapers, Ltd.

MR. KENNETH O. YOUNG is taking up residence in the United States, where his temporary address will be c/o Mr. Clarence R. Duckworth, 541 South Dettman Road, Jackson, Mich.

DEATHS

The Editor regrets to announce the deaths of the following Members:

MR. ARTHUR SMITH, General Manager of Ductile Steels, Ltd., Wolverhampton, on 31 October 1948.

MR. ARTHUR TITLEY, of Sutton Coldfield, on 19 December 1948, at the age of 85. He was an Original Member of the Institute.

Note : Will members (in addition to informing the Institute's administrative department of changes of address, occupation, &c.) kindly notify the Editor, *separately*, of all changes of occupation, appointments, awards of honours and degrees, &c., as these matters interest their fellow members.

ELECTION OF ORDINARY MEMBERS AND STUDENT MEMBERS

The following 19 Ordinary Members and 50 Student Members were elected on 30 December 1948:

As Ordinary Members

ASHLIN, William Henry Sandford, Director, Broom Ashlin Engineering Company, Ltd., Casilla 510, Valparaiso, Chile.

AUSTIN, Derek Tracy, B.Sc., Student Metallurgical Engineer, Queen's University, Kingston, Ont., Canada.

COWPER-COLES, Peter L., Director, Arkinstall Brothers, Ltd., Coventry Street, Birmingham.

DRURY, Philip Leslie, A.Met., Lecturer in Metallurgy, 109 Ringwood Road, Brimington, Chesterfield.

FAULKNER, Thomas, Works Manager, Imperial Chemical Industries, Ltd., Metals Division, Kynoch Works, Witton, Birmingham 6.

NEWS AND ANNOUNCEMENTS

- VAN GOCH, P. J., Managing Director, N.V. Wolders' Kopergieterij, Sluisjosdyk 41, Rotterdam, Holland.
- GUPTA, Prabuddhananda, B.A., Foreman, Rolling Mills, Ordnance Factory, Ambarnath, G.I.P., India.
- HÉRENGUEL, Jean François Germain, Dr.ès.Sci., Directeur du Service des Recherches, Sté. des Trefileries et Laminoirs du Havre, 9 rue du Moulin, Antony (Seine), France.
- HUBER, Max Georg, Chemist and Metallurgist, Georg Fisher, Ltd., Steelworks, Schaffhausen, Switzerland.
- KING, Brian Victor, Technical Engineer, Scottish Alloys, Ltd. (mail): 25 Montague Road, Richmond, Surrey.
- LAWRENCE, Arthur William, W. Lawrence and Son, Non-Ferrous Founders, 100 Hackford Road, Brixton, London, S.W.9
- PODMORE, Ronald Frank, Head of Metal Sales and Shipping Department, Roan Antelope Copper Mines, Ltd., and Mufulira Copper Mines, Ltd., Selection Trust Buildings, Masons Avenue, London, E.C.2.
- ROBSON, Ernest, General Manager, The Manganese Bronze and Brass Company, Ltd., Handford Works, Ipswich, Suffolk.
- SCORTECCI, Professor Antonio, Director, Istituto Siderurgico Finsider, Cornigliano, Genova, and Professor of Metallurgy at the Università degli Studi di Genova, Italy.
- SILCOCK, Elfrid, General Manager, The Monotype Corporation, Ltd., Salfords, Redhill, Surrey.
- SISCO, Frank Thayer, Director, Alloys of Iron Research, 29 West 39th Street, New York 18, N.Y., U.S.A.
- THOMAS, Archibald Hurlstone, Sales Manager, Imperial Chemical Industries, Ltd., Midland Region, Dog Kennel Lane, Oldbury, Birmingham.
- WALTERS, Stephen Joseph Michael, Technical Representative, Whitehead Iron and Steel Company, Ltd. (mail): Moss Lodge Hotel, Manchester Road, Ashton-under-Lyne, Lancashire.
- WILSON, E. P. B., Chemical Engineer, International Combustion, Ltd., Derby.

As Student Members

- ANDERSON, Charles, B.A., Student of Metallurgy, Emmanuel College, Cambridge.
- ATKINSON, George Dennis, Student of Metallurgy, King's College, University of Durham, Newcastle-on-Tyne.
- BALASUBRAMANIAN, V. T., Student of Metallurgy, Benares Hindu University, Benares, India.
- BATE, Alan Thomas, Laboratory Assistant, Imperial Chemical Industries, Ltd., Metals Division, Witton, Birmingham 6.
- BRIDGER, Edmund Ian, Laboratory Assistant, Imperial Chemical Industries, Ltd., Metals Division, Witton, Birmingham 6.
- BUDD, Richard Thomas, B.Sc., Technical Officer, Imperial Chemical Industries, Ltd., Metals Division, Witton, Birmingham 6.
- BUTLER, Geoffrey Albert, Laboratory Assistant, Imperial Chemical Industries, Ltd., Metals Division, Witton, Birmingham 6.
- CLEWS, Kenneth James, Research Metallurgist, Imperial Chemical Industries, Ltd., Metals Division, Witton, Birmingham 6.
- CRAIG, Francis John, B.A., Research Student in Metallurgy, University of Oxford.

NEWS AND ANNOUNCEMENTS

- DESCOVICH, Sergio, Dr.-Ing., Head, Mechanical Working Division, Istituto Siderurgico, Cornigliano, Genova, Italy.
- DUNTHORNE, Hector Barnett, Laboratory Assistant, High Duty Alloys, Ltd., Slough, Buckinghamshire.
- ELDRED, Vernon Walter, B.A., Student of Metallurgy, St. Catherine's College, Cambridge.
- EVANS, Lionel Stanley, Student of Metallurgy, Birmingham University.
- FAGG, Dennis Norman, B.Met., Metallurgist, High Duty Alloys, Ltd., Slough, Buckinghamshire.
- HARDIE, Donald, Student of Metallurgy, King's College, University of Durham, Newcastle-on-Tyne.
- HARVEY, Norman Bryce, Laboratory Assistant, Imperial Chemical Industries, Ltd., Metals Division, Witton, Birmingham 6.
- HEAP, Harry Rodney, B.Sc., Student of Metallurgy, 44 Chesterfield Road, Blackpool, Lancashire.
- HENDERSON, Thomas Andrew, Student of Metallurgy, King's College, University of Durham, Newcastle-on-Tyne.
- HEWSON, (Miss) Joan, Laboratory Assistant, Imperial Chemical Industries, Ltd., Metals Division, Witton, Birmingham 6.
- HOLMES, Eric, B.A., Metallurgist, Imperial Chemical Industries, Ltd., Metals Division, Witton, Birmingham 6.
- JEFFERY, Ronald Arthur, B.A., Metallurgist, Research Laboratory, Associated Electrical Industries, Ltd., Aldermaston Court, Aldermaston, near Reading, Berkshire.
- JONES, Charles Trevor, Laboratory Assistant, Imperial Chemical Industries, Ltd., Metals Division, Witton, Birmingham 6.
- JONES, William Victor, Student of Metallurgy, Birmingham University.
- LOWE, (Miss) Jean Margaret, Laboratory Assistant, Imperial Chemical Industries, Ltd., Metals Division, Witton, Birmingham 6.
- LYNAM, Eric Royston, Laboratory Assistant, Imperial Chemical Industries, Ltd., Metals Division, Witton, Birmingham 6.
- LYONS, Peter, Laboratory Assistant, Imperial Chemical Industries, Ltd., Metals Division, Witton, Birmingham 6.
- MEAD, Harry Wilfrid, Research Student, Department of Metallurgy, Sheffield University.
- MUSCOTT, Arthur, Student of Metallurgy, Manchester University.
- PATHAK, Bhasker Ramchandra, M.Sc., Research Student, Department of Metallurgy, Manchester University.
- PEAKE, Dudley Miller, Assistant Technical Officer, Imperial Chemical Industries, Ltd., Metals Division, Witton, Birmingham 6.
- PEARCE, Christopher Bernard, Laboratory Assistant, Imperial Chemical Industries, Ltd., Metals Division, Witton, Birmingham 6.
- PEARSON, William Burton, D.F.C., M.A., Research Student in Metallurgy, Oxford University.
- PERRIAM, Leonard Thomas, B.A., Research Physicist, Imperial Chemical Industries, Ltd., Metals Division, Witton, Birmingham 6.
- PERRY, Geoffrey Samuel, Laboratory Assistant, Imperial Chemical Industries, Ltd., Metals Division, Witton, Birmingham 6.
- POWELL, David Ronald, Metallurgical Chemist, Llanelly Steel Company (1907), Ltd., Llanelly, South Wales.

NEWS AND ANNOUNCEMENTS

- PUGH, Stanley Frederick, B.A., Research Metallurgist, Imperial Chemical Industries, Ltd., Metals Division, Kynoch Works, Witton, Birmingham 6.
- REID, George Hunter, Laboratory Assistant, Imperial Chemical Industries, Ltd., Metals Division, Witton, Birmingham 6.
- REYNOLDS, Jeffrey Alan, Student of Metallurgy, King's College, University of Durham, Newcastle-on-Tyne.
- SHAW, Geoffrey James, Student of Metallurgy, Birmingham University.
- STANTON, Robert Henry, Student of Metallurgy, Birmingham University.
- THWAITES, Colin John, B.Sc., A.R.S.M., Research Metallurgist, British Non-Ferrous Metals Research Association, Euston Street, London, N.W.1.
- TOLCHER, Hugh, Student of Metallurgy, Sir John Cass Technical Institute, Jewry Street, London, E.C.3.
- WALFORD, John Graham, B.Sc., Research Physicist, Metal Flow Research Laboratory, British Iron and Steel Research Association, 41 Doncaster Street, Sheffield 3.
- WALLIS, Raymond Marriage, B.Sc., Student, Cambridge University.
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- WATKINS, Ronald John, Assistant Technical Officer, Research Department, Imperial Chemical Industries, Ltd., Metals Division, Witton, Birmingham 6.
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- WHITHORN, Arnold Charles, Laboratory Assistant, Imperial Chemical Industries, Ltd., Metals Division, Witton, Birmingham 6.
- WILSON, Laurence Reginald, Student of Metallurgy, Manchester University.
- YAO, Tung-Ping, B.Sc., Research Student in Metallurgy, Birmingham University.

LETTER TO THE EDITOR

Monographs on "The Structure of Metals and Alloys" and "Atomic Theory for Students of Metallurgy"

DEAR SIR,

It is regretted that a sentence on page 45 of the writer's "The Structure of Metals and Alloys" and one on page 7 of "Atomic Theory for Students of Metallurgy" is ambiguous or incorrect. The kX. unit of length is larger than the true Angström unit. When a length is expressed in kX. units the *numerical value* is thus smaller than when the length is expressed in true Angström units, and *values* in kX. units require multiplying by 1.00202 in order to give the values in the true Angström units. We have thus: 1 crystal Angström = 1 kX. unit = 1.00202×10^{-8} cm.

Owing to a most unfortunate mistake, an incorrect corrigendum slip was inserted on page 11 of the second printing of "Atomic Theory for Students of Metallurgy", and this should

NEWS AND ANNOUNCEMENTS

be removed, as the original printing was correct. I can only apologize for any confusion that has been caused.

Yours, etc.

W. HUME-ROTHERY.

Oxford,

11 December 1948.

Note by the Editor :

It would be appreciated if University teachers, in particular, would give the widest publicity to these corrections, as both volumes referred to are standard text-books in many Universities.

NEWS OF LOCAL SECTIONS AND ALLIED SOCIETIES

BIRMINGHAM LOCAL SECTION

Symposium on Techniques of Metallurgical Investigations

Friday, 18 February 1949

This Symposium, arranged by the Birmingham Local Section, will be held on Friday, 18 February 1949, at the Chamber of Commerce, New Street, Birmingham, and will deal with modern advances in testing and examination of metals. The proceedings will occupy three sessions :

Mechanical Testing—11 a.m. to 1 p.m.

Metallography—The Microscope—2.45 to 4.45 p.m.

Metallography—Other Aspects—5.15 to 7.0 p.m.

At each session a group of papers will be presented by their authors, after which supplementary verbal contributions (limited to 10 minutes) will be received and the meeting thrown open to general discussion.

The papers will include :

“The Application of Strain Gauges to the Mechanical Testing of Metals”, by R. T. Budd and R. J. Parker.

“Testing at High Temperatures”, by H. E. Gresham.

“Life Testing of Engine Components”, by S. T. Harrison.

“New Investigations on the Preparation of the Exposed Surface of Aluminium”, by Professor G. Chaudron and Professor P. J. G. Lacombe.

“The Examination of Metal Surfaces by Taper Section Methods”, by E. Rabinowicz.

“Micro-Hardness Testing in Metallography”, by E. C. Perryman.

“The Relation of X-Ray and Microscopical Metallography”, by Dr. A. J. Bradley.

“Micro-Radiography of Metals”, by Dr. W. Betteridge.

with an additional paper, probably dealing with an application of electron diffraction methods.

NEWS AND ANNOUNCEMENTS

Advance synopses of the papers will be forwarded to those who register for the Symposium. Registration fee 5s. (inclusive of tea). Lunch at the White Horse, Congreve Street, 6s.

It will be helpful if those who intend to be present will complete the reply form which is printed on p. 73.

SOUTH WALES LOCAL SECTION

Observations on White Metals for Bearings

The President, Sir Arthur Smout, J.P., accompanied by the Secretary, paid an official visit to the South Wales Local Section on Tuesday, 30 November 1948, when, at the University College of Swansea, Professor H. O'Neill, D.Met., gave an address on "Observations on White Metals for Bearings". Mr. D. W. Hopkins, M.Sc., the Chairman of the Section was in the Chair, and there was a large attendance.

Professor O'Neill dealt with the factors involved in the failure of bearing metals in railway work, and internal combustion engines. The incidence of fatigue cracking when the alloy contained an easily fusible metallographic network was emphasized. This required the elimination of lead in tin-base metals, and the avoidance of the intermediate alloys containing about 60% tin.

From the point of view of tin conservation during the last war, it was shown that these latter alloys could advantageously be replaced by lead-base metal. Reference was made to the fatiguing action produced in tin-base bearings and not in lead-base by the irregular thermal expansion effects of the tin crystals. Tests for the determination of the bonding strength between lining and backing were described, and finally an account was given of a new works' process for separating mixed borings of various white metals and backing metals.

OTHER NEWS

EXHIBITION OF INDUSTRIAL RADIOGRAPHS

An exhibition of industrial radiographs will be held at the Spring Meeting of the Industrial Radiology Group at the Institute of Physics on Friday and Saturday, 18 and 19 February 1949. Entries should be suitable for showing on standard viewing lanterns (mounted prints may also be submitted) and should, wherever possible, be accompanied by photographs or samples of the specimens which they represent. A short description should accompany each entry.

Intending exhibitors should apply to the Institute of Physics, 47 Belgrave Square, London, S.W.1, for entry forms.

CONFERENCE ON INSTRUMENTS AND MEASUREMENTS, STOCKHOLM, 10-15 MAY 1949

The Swedish Royal Academy of Technical Sciences (IVA) and the Swedish Association of Technical Physicists (TFF) will hold an international conference on instruments and measurements in Stockholm from 10 to 15 May 1949. The provisional programme

NEWS AND ANNOUNCEMENTS

includes symposia on industrial spectroscopy ; testing of materials and mechanical measurements ; industrial control ; and metrology.

The official languages of the conference will be English, French, German, and Swedish. Contributions of papers, at least in the form of abstracts, must reach the organizers not later than 1 April 1949. The membership fee is 10 Swedish crowns.

An international exhibition of instruments and laboratory equipment will be arranged to be held from 7 to 15 May.

Fuller particulars of the conference may be obtained from Mr. Owe Berg, Instruments and Measurements Conference, Stockholm 5, Sweden.

COUNCIL OF INDUSTRIAL DESIGN : PROPOSED NATIONAL EXHIBITION OF METAL FINISHING

At a meeting held in London on 3 November 1948, presided over by Sir Charles Goodeve, and attended by about 250 representatives of learned societies, Government departments, trade associations, research associations, firms producing material and plant used in finishing processes, and the trade and technical press, it was decided to support a proposal that a National Exhibition of Metal Finishing be held in London in the autumn. It will be held at Earl's Court, London, from 31 August to 13 September 1949.

The Technical Sub-Committee of the Industrial Finishes Committee of the Council of Industrial Design was elected as follows : Mr. E. A. Ollard (British Non-Ferrous Metals Research Association), *Chairman* ; Dr. J. C. Chaston (Johnson, Matthey and Co., Ltd.) ; Dr. G. E. Gardam (Design and Research Centre, Goldsmiths' Hall) ; Mr. J. T. Gray (Stewart and Gray, Ltd.) ; Mr. D. G. Hawes (Cellon, Ltd.) ; Mr. G. M. Heath (Imperial Chemical Industries, Ltd.) ; Mr. H. J. Plaster (Metallisation, Ltd.) ; Mr. G. E. Sandland (The Mond Nickel Co., Ltd.) ; Mr. B. Workman (J. V. Rushton (London), Ltd.) ; and Mr. W. E. Wright (The Pyrene Co., Ltd.). Mr. S. D. Cooke (Council of Industrial Design) is Honorary Secretary to the Technical Sub-Committee.

FOURTH WORLD POWER CONFERENCE, LONDON, 10-15 JULY 1950

The theme of the conference, which will be held in London from 10 to 15 July 1950, will be "World Energy Resources and the Production of Power".

At the end of the conference it is expected that most of the members will take part in alternative study tours of about one week's duration.

DIARY FOR FEBRUARY

LOCAL SECTIONS MEETINGS

THURSDAY, 3 FEBRUARY

Birmingham Local Section.—Dr. R. Genders : "Extrusion". (James Watt Memorial Institute, Great Charles St., Birmingham, at 6.30 p.m.)

TUESDAY, 8 FEBRUARY

South Wales Local Section.—G. L. Evans : "A Visit to Africa". (University College, Singleton Park, Swansea, at 6.30 p.m.)

NEWS AND ANNOUNCEMENTS

THURSDAY, 10 FEBRUARY

London Local Section.—Dr. T. P. Hoar: "Metallic Corrosion". (4 Grosvenor Gardens, London, S.W.1, at 7 p.m.)

MONDAY, 14 FEBRUARY

Scottish Local Section.—R. E. Tucker: "Metals for Modern Clock and Instrument Making". (39 Elmbank Crescent, Glasgow, C.2, at 6.30 p.m.)

FRIDAY, 18 FEBRUARY

Birmingham Local Section.—All-day Symposium on "Techniques of Metallurgical Investigations". (Chamber of Commerce, New Street, Birmingham. Mechanical Testing, 11 a.m. to 1.0 p.m.; Metallography—The Microscope, 2.45 to 4.45 p.m.; Metallography—Other Aspects, 5.15 to 7 p.m.)

FRIDAY, 25 FEBRUARY

Sheffield Local Section.—E. J. Bradbury: "Melting and Rolling of Nickel Silver". Joint meeting with the Sheffield Trades Technical Society. (Grand Hotel, Sheffield, at 6.30 p.m.)

OTHER MEETINGS

TUESDAY, 1 FEBRUARY

Electrodepositors' Technical Society, Midlands Centre.—J. N. Hitchen: "Lacquering in the Plating Trade". (James Watt Memorial Institute, Great Charles St., Birmingham 3, at 6.30 p.m.)

Institution of Structural Engineers, Northern Counties Branch.—W. Muckle: "Light Alloys". (Cleveland Scientific and Technical Institution, Corporation Rd., Middlesbrough, at 6.30 p.m.)

WEDNESDAY, 2 FEBRUARY

Institute of Fuel, Midland Section.—A. Stirling, "Fuel Efficiency at Corby Iron and Steel Works". (James Watt Memorial Institute, Great Charles St., Birmingham, at 2.30 p.m.)

Institution of Structural Engineers, Northern Counties Branch.—W. Muckle: "Light Alloys". (Neville Hall, Westgate Rd., Newcastle-on-Tyne, at 6.30 p.m.)

Manchester Metallurgical Society.—J. Glen: "Precipitation Hardening Effects in Relation to High Temperature Testing". Joint meeting with the Iron and Steel Institute. (Engineers' Club, Albert Sq., Manchester, at 6.30 p.m.)

THURSDAY, 3 FEBRUARY

Chemical Society.—Dr. F. P. Bowden, F.R.S.: "The Friction and Lubrication of Metal Surfaces". Joint meeting with the University College of Swansea Students' Chemical Society. (University College, Swansea, at 6 p.m.)

Leeds Metallurgical Society.—Dr. R. W. Bailey: "The Function of Ductility in Design". (Chemistry Dept., The University, Leeds 2, at 7 p.m.)

NEWS AND ANNOUNCEMENTS

Liverpool Metallurgical Society.—F. D. Waterfall: "Metallurgical Developments Connected with Heat-Treatment of Steels in Salt Baths". (Liverpool Engineering Society, 9 The Temple, 24 Dale St., Liverpool, at 7 p.m.)

FRIDAY, 4 FEBRUARY

Institute of Fuel, South Wales Section.—Film, presented by P. M. Machair, on the Ebbw Vale Works of Richard Thomas and Baldwins, Ltd. (Institute of Engineers, Cardiff, at 6 p.m.)

West of Scotland Iron and Steel Institute.—"Soaking Pits", by the Society of Furnace Builders. Joint meeting with the Iron and Steel Engineers' Group of the Iron and Steel Institute. (39 Elmbank Crescent, Glasgow, C.2, at 6.45 p.m.)

TUESDAY, 8 FEBRUARY

Institution of Chemical Engineers.—Discussion on Welded Pressure Vessel Code. (Geological Society, Burlington House, London, W.1, at 5.30 p.m.)

WEDNESDAY, 9 FEBRUARY

Electrodepositors' Technical Society, Sheffield and North-East Centre.—R. Nicol: "Protective Coatings by Electrodeposition". (Grand Hotel, Sheffield, at 6.30 p.m.)

THURSDAY, 10 FEBRUARY

Institute of Marine Engineers, South London Branch.—S. M. Reisser: "Some Aspects of Welding Structures". (Institute of Marine Engineers, 85-88 The Minories, London, E.C.3, at 6.30 p.m.)

Institution of Works Managers, Wembley Sub-Branch.—B. J. A. Bard: "Research and the Small Company". (Rest Hotel, Kenton, at 12.30 p.m.)

TUESDAY, 15 FEBRUARY

Chemical Engineering Group (Society of Chemical Industry).—Professor T. R. C. Fox: "Technical Education". (Geological Society, Burlington House, London, W.1, at 5.30 p.m.)

WEDNESDAY, 16 FEBRUARY

Institute of Fuel, Yorkshire Section.—J. R. Joyce: "Atomization of Liquid Fuels for Combustion". (The University, Leeds, at 2.30 p.m.)

Institute of Welding, North London Branch.—A. T. C. Burrows: "Conveyors". (Acton Technical College, London, W.3, at 7.30 p.m.)

Manchester Metallurgical Society.—A. W. Hothersall: "Electrodeposition for Engineering Purposes (not Decorative)". (Engineers' Club, Albert Sq., Manchester, at 6.30 p.m.)

Institute of Welding, West of Scotland Branch.—Discussion on the Welding of Light Cold-Rolled Sections, to be opened by M. Hudson and D. L. Bates. (39 Elmbank Crescent, Glasgow, C.2, at 7 p.m.)

NEWS AND ANNOUNCEMENTS

THURSDAY, 17 FEBRUARY

Chemical Society.—Dr. W. H. J. Vernon, O.B.E. : “ The Study of Surface Reactions on Metals ”. Joint meeting with the University College of North Wales and University of Liverpool Chemical Societies. (Department of Chemistry, University College of North Wales, Bangor, at 5.30 p.m.)

Institute of Fuel, East Midland Section.—Professor A. L. Roberts : “ Clay Minerals : Their Properties and Industrial Uses ”. (Gas Demonstration Theatre, Nottingham, at 6 p.m.)

Institution of Mining and Metallurgy. General Meeting. (Geological Society, Burlington House, London, W.1, at 5 p.m.)

Institution of Structural Engineers, Lancashire and Cheshire Branch.—H. A. Cadwell : “ New Regulations for the Design of Welded Structures ”. (College of Technology, Manchester, at 7 p.m.)

FRIDAY, 18 FEBRUARY

West of Scotland Iron and Steel Institute.—Q. C. McMillan : “ The Hardening Operation in the Practical Heat-Treatment of Steel ”. (39 Elmbank Crescent, Glasgow, C.2, at 6.45 p.m.)

MONDAY, 21 FEBRUARY

Institute of Welding.—E. V. Beatson : “ The Welding, Brazing, and Soldering of Coated Metals ”. Joint meeting with the Electrodepositors' Technical Society. (Institution of Civil Engineers, Great George St., London, S.W.1, at 6 p.m.)

Royal Society of Arts.—Dr. W. H. J. Vernon, O.B.E. : “ The Corrosion of Metals ”. First of two Cantor Lectures. (The Society, John Adam St., Adelphi, London, W.C.2, at 8 p.m.)

TUESDAY, 22 FEBRUARY

Institution of Heating and Ventilating Engineers, Scottish Branch.—G. G. Musted : “ Arc Welding in the Sheet Metal Industry, with Particular Reference to Pipe Welding.” (Engineering Centre, 351 Sauchiehall St., Glasgow, at 6.30 p.m.)

WEDNESDAY, 23 FEBRUARY

Geological Society of London.—Ordinary Evening Meeting. (Burlington House, Piccadilly, London, W.1, at 5 p.m.)

Institute of Welding.—Luncheon. (Café Royal, Regent St., London, W.1, at 12.30 for 1 p.m.)

THURSDAY, 24 FEBRUARY

Chemical Society.—Professor M. Polanyi, F.R.S. : “ The Nature of Scientific Convictions ”. Joint meeting with the Hull University College Scientific Society and the Hull and District Section of the Royal Institute of Chemistry. (Science Lecture Theatre, University College, Hull, at 6 p.m.)

Institute of Welding, South London Branch.—E. A. Whittaker : “ Welding in the Motor Body Industry ”. (Institute of Marine Engineers, 85-88 The Minories, London, E.C.3, at 6.30 p.m.)

NEWS AND ANNOUNCEMENTS

FRIDAY, 25 FEBRUARY

Electrodepositors' Technical Society, Sheffield and North-East Centre.—H. Evans: "Electrolytic Polishing". (Grand Hotel, Sheffield, at 6.30 p.m.)

MONDAY, 28 FEBRUARY

Royal Society of Arts.—Dr. W. H. J. Vernon, O.B.E., "The Corrosion of Metals". Last of two Cantor Lectures. (The Society, John Adam St., Adelphi, London, W.C.2, at 8 p.m.)

APPOINTMENTS VACANT

To conform to the requirements of the Control of Engagement Order, 1947, these advertisements are published for the information only of those who are "excepted persons" under the Order.

ANALYTICAL LABORATORY ASSISTANT, with some previous experience of metallurgical analysis, required immediately. Apply by letter stating experience, &c., to John Dale, Limited, London Colney, Herts.

ASSISTANT METALLURGIST required for control and development work in a progressive non-ferrous factory in East Anglia. Research experience would be an advantage, and the candidate should have a good theoretical background. Apply, stating age, qualifications, and salary required, to Box No. 252, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

ASSISTANT METALLURGIST, aged about 25, with an Honours Metallurgy Degree or equivalent qualifications, and preferably with 2-3 years' experience in a works metallurgical department, is required in the South-East London Area in a Works Metallurgical Laboratory. Apply by letter stating qualifications and experience to the Research Laboratories of the General Electric Co., Ltd., East Lane, North Wembley, Middlesex.

GRADUATE METALLURGIST required for training as installation and service engineer for heat-treatment and melting furnaces—mainly electrical. Previous works or research laboratory experience advantageous, though not essential. This is an excellent opportunity for a young man with a metallurgical training, who is prepared to acquire a practical knowledge of mechanical and electrical engineering and ultimately to accept full responsibility for the testing and handling over of large scale industrial plant. Apply, with full details, to Birlec, Limited, Tyburn Road, Erdington, Birmingham 24.

METALLURGIST required for general duties in Research Laboratory in West London Area. Candidate should have a good degree and preferably have had previous research experience. The salary offered would be up to the order of £550 per annum, depending upon age, qualifications, and experience. Applications should be made in writing to Box No. 254, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

SENIOR METALLURGIST, aged 30-45, with degree or equivalent qualification and industrial experience, required by long-established heavy non-ferrous foundry in the North-West. Salary according to qualifications, but approximately £1000 p.a. Accommodation available. Box No. 253, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

YOUNG METALLURGIST required for Laboratory Research on light metal alloys. B.Sc. or equivalent qualification essential. Initial salary £350. Apply: Secretary, Magnesium Elektron, Ltd., Clifton Junction, Manchester.

NORTHAMPTON POLYTECHNIC

St. John Street, London, E.C.1.

LECTURER IN METALLURGY. Applications are invited for the post of Lecturer in Metallurgy in the Department of Applied Chemistry. Candidates should be of good academic standing; industrial and/or research experience would be an added qualification. Duties of the person appointed will include the teaching of Engineering Metallurgy for the B.Sc. (Eng.) degree of the University of London, metallurgy for the examinations of the Institution of Metallurgists, City and Guilds of London Institute, and for National Certificates. Salary in accordance with the London Burnham Scale for technical teachers and, in addition, an annual remuneration of £50 will be offered as a post of special responsibility. Application forms to be returned by 12 February 1949. Further details and form of application may be obtained from the Secretary.

The Structure of Cast Iron

by **ALFRED BOYLES** of United States
Pipe and Foundry Co., Burlington, New Jersey.

A series of lectures with particular emphasis on the theoretical side of cast-iron metallurgy. A great deal remains to be learned about this plebeian among metals, for the common grey iron is an alloy of great complexity and one which has been somewhat neglected by physical metallurgists in favour of the more aristocratic members of the alloy domain.

The lectures are limited to the structure of cast iron as determined by the mechanism of freezing and transformation, and the argument is frankly addressed to metallurgists familiar with the steels, but unfamiliar with cast iron. Cast iron is dealt with as a ternary alloy of iron, carbon and silicon, the structure of which is modified by the minor elements, manganese, sulphur and phosphorus. Special alloying elements, added to produce specific properties, do not come within the scope of the lectures. Attention is centred for the most part on alloys of hypoeutectic composition, because most of the grey iron has been drawn upon freely and many references are cited.

The 124 pages of this book are well illustrated with figures and tables relating to the discussion, and the six chapters are subdivided into smaller groupings to explain thoroughly step by step in detail the various phases of cast-iron metallurgy.

124 Pages. Red Cloth Binding. Illustrations. 6 × 9. \$3.25.

AMERICAN SOCIETY FOR METALS
7301 EUCLID AVENUE CLEVELAND 3, OHIO

To Mr. E. H. Bucknall, Hon. Sec.,
Birmingham Local Section, Institute of Metals,
53 Halesowen Road, Quinton, Birmingham 32.

Symposium on Techniques of Metallurgical Investigations

I wish to attend the Symposium on 18 February 1949. Please
forward advance synopses to the following address.....

.....
.....

I wish to present a supplementary contribution to Session(s).....
.....which will deal with.....

I hope to contribute to the discussion on Session(s)

Please reserve me a place for lunch.

I enclose $\frac{\text{cheque}}{\text{P.O.}}$ for..... shillings, to cover the registration
fee (5s.) andticket for lunch (6s.).

(signed).....

BULLETIN ANALYTIQUE

Publication of the Centre National de la Recherche Scientifique, France

The *Bulletin Analytique* is an abstracting journal which appears monthly in two parts, Part I covering scientific and technical papers in the mathematical and physical sciences and their applications, Part II the biological sciences.

The *Bulletin*, which started on a modest scale in 1940, with an average of 10,000 abstracts per part, now averages 35,000 to 45,000 abstracts per part. The abstracts summarize briefly papers in scientific and technical periodicals received in Paris from all over the world, and cover the majority of the more important journals in the world scientific press. The scope of the *Bulletin* is constantly being enlarged to include a wider selection of periodicals.

The *Bulletin* thus provides a valuable reference book both for the laboratory and for the individual research worker who wishes to keep in touch with advances in subjects bordering on his own.

A specially interesting feature of the *Bulletin* is the microfilm service. A microfilm is made of each article as it is abstracted, and negative microfilm copies or prints from microfilm can be purchased from the editors.

The subscription rates for Great Britain are 4000 frs. (£5) per annum for each part. Subscriptions can also be taken out to individual sections of the *Bulletin* as follows:

	frs.	£	s.	d.
Pure and Applied Mathematics—Mathematics— Mechanics	550	14	6	
Astronomy—Astrophysics—Geophysics	700	18	0	
General Physics—Thermodynamics—Heat— Optics—Electricity and Magnetism	900	1	2	6
Atomic Physics—Structure of Matter	325	8	6	
General Chemistry—Physical Chemistry	325	8	6	
Inorganic Chemistry—Organic Chemistry— Applied Chemistry—Metallurgy	1800	2	5	0
Engineering Sciences	1200	1	10	0
Mineralogy—Petrography—Geology— Palaeontology	550	14	6	
Biochemistry—Biophysics—Pharmacology	900	1	2	6
Microbiology—Virus and Phages	600	15	6	
Animal Biology—Genetics—Plant Biology	1800	2	5	0
Agriculture—Nutrition and the Food Industries	550	14	6	

Subscriptions can be paid directly to the editors: Centre National de la Recherche Scientifique, 18 rue Pierre-Curie, Paris 5ème. (Compte-chèque-postal 2500-42, Paris), or through Messrs. H. K. Lewis & Co., Ltd., 136 Gower St., London, W.C.1.

THE INSTITUTE OF METALS

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INSTITUTE NEWS AND ANNOUNCEMENTS

INSTITUTE OF METALS (PLATINUM) MEDAL

The Institute of Metals Medal (in platinum) for 1949 has been awarded to WILLIAM HUME-ROTHERY, M.A., D.Sc., Ph.D., F.R.S., Royal Society Warren Research Fellow, Oxford University, in recognition of his outstanding contributions to the science of non-ferrous metallurgy.

METALLURGICAL ENGINEERING COMMITTEE

The Council has appointed a new standing Committee—the Metallurgical Engineering Committee—under the Chairmanship of Mr. D. F. Campbell, M.A., A.R.S.M., with the following terms of reference :

(a) To develop interest in metallurgical engineering in the non-ferrous metal industry and to promote the study of equipment and instruments used in the industrial melting, casting, and working of non-ferrous materials.

(b) To make recommendations to the Council regarding the need for holding special meetings, discussions, and symposia ; inviting papers or articles for publication ; or the publication of books or other literature to attain the objects for which the Committee was formed.

(c) To make suggestions to the appropriate Committees of the Institute in connection with the organization of special meetings or the production of publications approved by the Council on its recommendation.

Any matters which members wish to be brought to the attention of this Committee should be addressed to the Secretary.

SUSPENSION OF THE ENTRANCE FEE

In connection with the campaign, initiated by the President in a letter to the members, to bring about a really large increase in the Institute's membership during the present year, the Council has resolved to suspend the entrance fee (with effect from 1 January 1949) for a period of two years. The matter will then be reviewed.

Members are requested to make this decision widely known to potential members.

NEWS AND ANNOUNCEMENTS

TERM OF OFFICE OF THE PRESIDENT AND NOMINATION OF SENIOR VICE-PRESIDENT

The Council has resolved to recommend to the members that (after the termination of Sir Arthur Smout's second year of office as President) a President should in future normally hold office for one year only. The advantages of this arrangement would be that the Presidency would absorb one individual's full attention for a limited time only, and that it would make it possible for a greater number of members to hold the office. Sir Arthur Smout has agreed to serve as President for a second year at the Council's particular request.

It is the Council's intention, also, at the 1949 Annual General Meeting, and subsequently at each Annual General Meeting, to notify to the members the name of the "Senior Vice-President" (referred to in Article 42) whom it has elected to that position and to make it clear that in due course he will be its nominee for the next vacancy as President. The Senior Vice-President will not hold an additional office, but will be one of the six Vice-Presidents referred to in Article 19. The rights of members, under Article 22, to make their own nominations for President will not, of course, be affected.

The Council desires that the Senior Vice-President (their nominee for the next vacancy as President) shall be consulted by the President, and have an opportunity to obtain an intimate knowledge of the Institute's affairs, for a full year before the time when it is probable that he will be called on to assume the Presidency. The Senior Vice-President would also take the Chair at all Council Meetings and General Meetings of the Institute in the absence of the President.

The Council has elected MR. H. S. TASKER, B.A. (Vice-President), Chairman of Goodlass Wall and Lead Industries, Ltd., as Senior Vice-President for the year 1949-50, and feels confident that this nomination will meet with the complete and warm approval of the members.

ANNUAL GENERAL MEETING, 30 AND 31 MARCH AND 1 APRIL 1949

All members should have received, last month, the detailed programme and reply form relating to the 41st Annual General Meeting of the Institute, which will be held in London on three days—Wednesday, Thursday, and Friday, 30 and 31 March and 1 April 1949.

The attention of members is particularly directed to the whole-day Symposium on Metallurgical Aspects of Non-Ferrous Metal Melting and Casting of Ingots for Working, which will be held in the Hall of the Institution of Mechanical Engineers, Storey's Gate, Westminster, S.W.1, from 10 a.m. to 5 p.m. on Thursday, 31 March, and the Dinner-Dance to be held on the evening of the same day, at the Savoy Hotel. The Council hopes that both will be well attended.

NEWS AND ANNOUNCEMENTS

PROGRAMME

Wednesday, 30 March

10.0 a.m.—*General Meeting at the Institution of Mechanical Engineers, Storey's Gate, London, S.W.1.*

Institute business.

Report of Council.

Report of Honorary Treasurer.

Election of Officers for 1949-50.

Presentation of the 1949 Institute of Metals (Platinum)

Medal to Dr. WILLIAM HUME-ROTHERY, M.A., D.Sc.,
Ph.D., F.R.S.

Discussion of papers :

HALLOWES: "The Working Behaviour of Phosphorus-Deoxidized Coppers Containing Bismuth" (No. 1139, *Sept.* 1948).

ENTWISTLE: Jointly—"The Damping Capacity of Metals in Transverse Vibration" (No. 1144, *Oct.* 1948), and
"The Effect of Grain-Size on the Damping Capacity of Alpha Brass" (No. 1145, *Oct.* 1948).

1.5 p.m.—*Buffet lunch* (price 6s., for ticket-holders only).

2.30 p.m.—*Discussion of papers :*

BLAZEY, BROAD, GUMMER, and THOMPSON: "The Flow of Metal in Tube Extrusion" (No. 1150, *Dec.* 1948).

ROGERS: "The Promotion and Acceleration of Metallic Corrosion by Micro-Organisms" (No. 1140, *Sept.* 1948).

5 p.m.—Meeting adjourned.

Thursday, 31 March

10.0 a.m.—*General Meeting resumed at the Institution of Mechanical Engineers.*

Symposium on Metallurgical Aspects of Non-Ferrous Metal Melting and Casting of Ingots for Working. (All papers published in *Jan.* 1949.)

BAILEY and BAKER: "Melting and Casting of Non-Ferrous Metals" (No. 1156).

WADDINGTON: "The Production of Refined-Copper Shapes" (No. 1157).

MURPHY and CALLIS: "Melting and Casting Aluminium Bronze Ingots for Subsequent Working" (No. 1158).

BOND-WILLIAMS: "The Application of Flux Degassing to Commercially Cast Phosphor-Bronze" (No. 1159).

COOK and FLETCHER: "The Melting and Casting of Brass" (No. 1160).

BRADBURY and TURNER: "The Melting and Casting of Nickel Silver at the Works of Messrs. Henry Wiggin and Co., Ltd." (No. 1161).

1.5 p.m.—*Buffet lunch* (price 6s., to ticket-holders only).

2.30 p.m.—Symposium resumed.

5 p.m.—Symposium concluded; General Meeting adjourned.

7.15 p.m.—Dinner-Dance at the Savoy Hotel, Strand, W.C.2.
(Tickets 31s. 6d.)

NEWS AND ANNOUNCEMENTS

Friday, 1 April

10.0 a.m.—*General Meeting resumed at 4 Grosvenor Gardens, London, S.W.1.*

Discussion of papers :

VARLEY : "The Recovery and Recrystallization of Rolled Aluminium of Commercial Purity" (No. 1151, Dec. 1948).

PUMPHREY and JENNINGS : "High-Temperature Tensile Properties of Cast Aluminium-Silicon Alloys and their Constitutional Significance" (No. 1152, Dec. 1948), and "A Consideration of the Nature of Brittleness at Temperatures Above the Solidus in Castings and Welds in Aluminium Alloys" (No. 1153, Dec. 1948); also PUMPHREY and MOORE : "A Consideration of the Nature of Brittleness at Temperatures Below the Solidus in Castings and Welds in Aluminium Alloys" (No. 1154, Dec. 1948) (joint discussion).

If time permits :

BURDEN and BARKER : "The Measurement of Grain-Size of Tungsten and Tungsten Carbide Powders Used for the Manufacture of Hard Metal" (No. 1142, Oct. 1948).

1.0 p.m.—The General Meeting will conclude.

AUTUMN MEETING, PARIS, 1949

The Autumn Meeting will be held in Paris in September. Dates and fuller particulars will be issued to members; it is probable that the meeting will commence on 26 September.

STUDENTS' EDUCATIONAL TOUR, BIRMINGHAM, 4-8 APRIL 1949

With reference to the Students' Tour, already announced, members in general may be interested to know some details and what laboratories and works are to be visited. The programme of the tour was sent to Associate Members and Student Members only.

The inclusive fee for the tour is (a) £6 10s. for those who are accommodated at the University hostel, and (b) £2 5s. for those living locally. The fee for (a) includes meals from lunch on 4 April to lunch on 8 April, inclusive; transport to and from all official visits; hire of bed linen; and gratuities; that for (b) includes lunches on 5, 6, and 7 April and transport to and from all official visits.

A list of laboratories and works to be visited is given below. The Council is most grateful to the Directors and other authorities concerned for their co-operation in this important educational effort. (Student Members are requested to note that the visit will be to the Kitts Green and *not* the Argyle Street works of James Booth and Co., Ltd., as stated, in error, in the programme.)

Whole-Day Visits

Austin Motor Co., Ltd., Longbridge Works.

Reynolds Light Alloys, Ltd., Redditch, and Reynolds Rolling Mills, Ltd., Oldbury.

NEWS AND ANNOUNCEMENTS

Half-Day Visits

University of Birmingham: Metallurgical Laboratories, Edgbaston, Birmingham 15.

Accles and Pollock, Ltd., Oldbury.

W. and T. Avery, Ltd., Soho Foundry, Birmingham 40.

Birlec, Ltd., Tyburn Road, Erdington, Birmingham 24.

Birmingham Aluminium Casting (1903) Co., Ltd., Smethwick, Birmingham 40.

Birmingham Battery and Metal Co., Ltd., Selly Oak, Birmingham 29.

Birmingham Small Arms Co., Ltd., Birmingham 11.

James Booth and Co., Ltd., Kitts Green, Birmingham 26.

Earle, Bourne and Co., Ltd., Heath Street South, Birmingham 18.

General Electric Co., Ltd., Witton, Birmingham 6.

Guest, Keen and Nettlefolds, Ltd., Heath Street, Birmingham 18.

Hughes-Johnson Stampings, Ltd., Langley Green.

Imperial Chemical Industries, Ltd., Metals Division, Witton, Birmingham 6.

Imperial Chemical Industries, Ltd., Metals Division, Selly Oak, Birmingham 29.

Imperial Chemical Industries, Ltd., Metals Division, Smethwick, Birmingham 40.

Joseph Lucas, Ltd., Great King Street, Birmingham 19.

McKechnie Brothers, Ltd., Rotton Park Street, Birmingham 16.

William Mills, Ltd., Friar Park Foundry, Friar Park Road, Wednesbury, Staffs.

Mint, Birmingham, Ltd., Icknield Street, Birmingham 18.

Mond Nickel Co., Ltd., Laboratories, Wiggin Street, Birmingham 16.

Patent Shaft and Axletree Co., Ltd., Wednesbury, Staffs.

Round Oak Steel Works, Ltd., Brierley Hill, Staffs.

Walter Somers, Ltd., Haywood Forge, Halesowen.

Stewarts and Lloyds, Ltd., Wheelwright Road, Erdington, Birmingham 24.

United Wire Works (Birmingham), Ltd., Adderley Street, Birmingham 9.

Henry Wiggin and Co., Ltd., Wiggin Street, Birmingham 16.

CONTENTS LIST OF PUBLICATIONS, WITH AUTHOR INDEX, 1909-1948

A Contents List of the publications of the Institute, with Author Index to the papers, &c., presented to the Institute from 1909 to 1948, inclusive (Volumes 1-74 of the *Journal*) has just been published as "Miscellaneous Publication No. 4".

This 57-page booklet, which is priced at 3s. 6d. (to members 1s. 9d.), post free, will be found most useful for quick reference, by author, to the papers that have been published by the Institute.

Orders for the booklet can be met immediately, on receipt of the appropriate remittance.

BINDING CASES FOR THE JOURNAL AND METALLURGICAL ABSTRACTS, 1947

The binding cases for the *Journal*, Volume 73, 1947, and for *Metallurgical Abstracts*, Volume 14, 1947, have now been received

NEWS AND ANNOUNCEMENTS

and despatched to all who have requested them. Binding cases are supplied, free of charge, to all members who indicate their wish to receive them.

Mr. W. A. Newark, 2 Clerkenwell Green, London, E.C.1, is familiar with the make-up of the Institute's publications, and is prepared to bind the volumes at 4s. 9d. per volume, or 9s. 6d. per two annual volumes, including the cost of postage to the member's address.

BACK ISSUES OF PUBLICATIONS

A general index to *Metallurgical Abstracts*, Series II, Volumes 1-10 (1934-1943), inclusive, is now being set in type. Because of the magnitude of the production of this book, there will be a considerable delay before it is published. In the meantime, however, members who do not possess all the volumes of this series are recommended to obtain from the Secretary an estimate for supplying the missing issues at reduced rates.

These ten volumes of abstracts, with the general index, will be invaluable for reference to the world's literature relating to general and non-ferrous metallurgy and allied subjects for the period they cover.

CHAIRMEN OF COMMITTEES FOR 1949-50

The Council has elected the following to be the chairmen of committees for the year 1949-50. They will take up their responsibilities with the formation of new committees after the Annual General Meeting of the Institute at the end of March.

Finance and General Purposes Committee.—Major C. J. P. Ball, D.S.O., M.C.

Local Sections Committee.—Mr. H. W. G. Hignett, B.Sc.

Medal Committee.—The President.

Metal Physics Committee.—Dr. N. P. Allen, M.Met.

Metallurgical Engineering Committee.—Mr. D. F. Campbell, M.A., A.R.S.M.

Nominations Committee.—The President.

Publication Committee.—Professor H. O'Neill, D.Sc., M.Met.

PERSONALITIES

DR. W. HUME-ROTHERY

Dr. William Hume-Rothery, F.R.S., who has been awarded the Institute of Metals (Platinum) Medal for 1949, in recognition of his outstanding contributions to the science of non-ferrous metallurgy, was born on 15 May 1899 and was educated at Cheltenham College; the Royal Military College, Woolwich (Prize Cadet, 1916); and Magdalen College, Oxford (1918). In 1921 he was awarded a Demyship in Natural Science, and graduated in 1922, with First-Class Honours in Chemistry.

From 1922 to 1925 he studied at the Royal School of Mines, London, under the late Sir Harold Carpenter, and took the London Ph.D. degree with a thesis on intermetallic compounds, in which the first idea of electron compounds was introduced. He was awarded a Senior Demyship at Magdalen College, Oxford, in 1925, and carried out research work at Oxford, at first in

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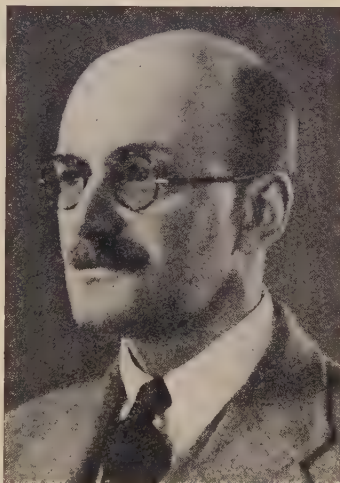
temporary accommodation provided by the late Professor W. H. Perkin and later in the Inorganic Chemistry Department, first under Professor F. Soddy and later under Sir Cyril Hinshelwood.

Dr. Hume-Rothery was elected to the Armourers' and Brasiers' Research Fellowship of the Royal Society, in 1929. In 1934 he received a Beilby Memorial Award, and was elected to a Warren Research Fellowship of the Royal Society, which he has held—except for one year, between two appointments—ever since; in the same year he published, with G. W. Mabbott and K. W. Channel-Evans, a paper which led to the idea of atomic size factor. He was elected a Fellow of the Royal Society in 1937, and awarded the Sc.D. degree of Oxford University in the same year. From 1938 to 1943 he held a Magdalen College, Oxford, Fellowship by special election.

Since his election to a Warren Research Fellowship, Dr. Hume-Rothery has published many scientific papers in collaboration with colleagues, students, and research assistants, and notably with Dr. G. V. Raynor and Dr. P. W. Reynolds on the constitution and theories of non-ferrous alloys, in the *Philosophical Transactions* and the *Proceedings of the Royal Society*, the *Journal of the Institute of Metals*, *Journal of the Iron and Steel Institute*, and *Philosophical Magazine*. During the war he was occupied on extra-mural research for the Ministry of Supply and the Ministry of Aircraft Production, mainly in connection with titanium carbides in steels, electrodeposited chromium, and the constitution of aluminium alloys. In 1946 he was the Annual Lecturer to the American Institute of Mining and Metallurgical Engineers.

He is the author of "The Metallic State" (Oxford University Press, 1931); "The Structure of Metals and Alloys" (Institute of Metals Monograph No. 1, 1936, now in its sixth printing); "Atomic Theory for Students of Metallurgy" (Institute of Metals Monograph No. 3, 1946, now in its third printing); and "Electrons, Atoms, Metals, and Alloys" (Iliffe and Sons, Ltd., 1948). He is a Member of Council of the Institution of Metallurgists; and a member of the Metal Physics Committee of the Institute of Metals, the Metal Physics Committee of the British Iron and Steel Research Association, and of the Metallurgical Advisory Council of the Ministry of Supply and of the associated Basic Properties and Heat-Resistance Committees. He was elected a member of the Institute of Metals in 1923.

In 1931 Dr. Hume-Rothery married Elizabeth Alice Fea, and has one daughter. His principal recreations are painting and fishing.



NEWS AND ANNOUNCEMENTS

DR. KENT R. VAN HORN

Dr. Kent R. Van Horn, who had been Chief of the Cleveland Branch of the Aluminum Research Laboratories of the Aluminum Company of America since November 1945, was appointed an Assistant Director of Research to the Company with effect from 1 January 1949. Mr. Maurice W. Daugherty, Assistant Chief of the Cleveland laboratories during the same period, has succeeded Dr. Van Horn as Chief. Dr. Van Horn will remain at Cleveland, where he will continue to devote his energies to the improvement of casting and forging processes and alloys, which is the special function of the Cleveland Research Division.

Dr. Van Horn, the son of Dr. Frank R. "Count" Van Horn of the Case faculty, graduated from the Case Institute of Technology in 1926. From Case he went to Yale University for his doctorate. He joined the Aluminum Company of America in 1929 as a research metallurgist, and has since been the author of numerous scientific and technical papers, as well as co-author, with Dr. George Sachs, of a text-book on "Practical Metallurgy".

In 1944, at the age of 39, he became the youngest man ever to be elected President of the American Society for Metals. He is also a Past-President of the American Industrial Radium and X-Ray Society, and a member of several professional societies—including the American Institute of Mining and Metallurgical Engineers and the American Society for Testing Materials.

Dr. Van Horn was elected a member of the Institute of Metals in 1927.

MR. K. M. SPRING

Mr. K. M. Spring, who was last year elected Honorary Secretary of the South Wales Local Section, was born in Swansea on 7 September 1910. He was educated at Glanmor Secondary School, and later at the Swansea Technical College, where, in 1933, he was awarded the City and Guilds of London Certificate in the metallurgy of the non-ferrous metals.



In 1926 he joined the firm of D. Pascoe Clark and Sons, tin-plate exporters, as a junior clerk; he left in 1927 to take the post of Junior Assistant in the Chemical Laboratory of British Copper Manufacturers, Ltd., which later became a subsidiary company of Imperial Chemical Industries, Ltd. At Landore, from 1930 to 1938, he gained a fairly wide experience in the physical testing laboratories, copper refineries, and the brass

casting, copper and brass rolling mill, and inspection departments.

From 1938 to 1942 Mr. Spring was Assistant to the Production Manager, and later, until 1947, was personal assistant to the

NEWS AND ANNOUNCEMENTS

Works Manager. In 1947 he was appointed Manager of the Brass Sand-Casting Department, the position that he now holds.

He was elected a member of the Institute in 1934, was Honorary Treasurer of the Swansea (later, South Wales) Local Section from 1936 until 1948, when he was elected Honorary Secretary of the Section. In 1947 Mr. Spring was elected an Associate of the Institution of Metallurgists.

PERSONAL NOTES

MR. W. H. BOWMAN has been appointed a Joint Executive Director of TI Aluminium, Ltd., the new subsidiary company of Tube Investments, Ltd. The Company has been formed to co-ordinate the administrative, research, and marketing organizations of the Group's aluminium division, comprising Reynolds Light Alloys, Ltd., Reynolds Rolling Mills, Ltd., and the South Wales Aluminium Co., Ltd. Jointly with Mr. E. Austyn Reynolds and Mr. J. H. Catling, Mr. Bowman will be responsible for the production, administration, and marketing of the products of the Companies involved.

MR. GEORGE CAMPBELL, who was recently awarded a Mond Nickel Fellowship to study the various stages of the organization from research to large-scale production of specialized industries in the U.S.A. and Canada, left for New York in January and will be away from England for most of 1949. Any correspondence for him should be addressed c/o M. Parkinson, 2 Balgore Lane, Gidea Park, Essex.

MR. P. GRAHAM CLEMENTS has joined the staff of Joseph Crosfield and Sons, Ltd., of Warrington. His new address is 16 Cawdor St., Stockton Heath, Warrington, Lancs.

MAJOR GILBERT DENNISON has been appointed a member of the Jewellery and Silverware Development Council.

MR. JAN FIGIEL has accepted a post with Zjednoczone Zakłady Metali, Merelarnych, Katowice, Poland.

DR. F. A. FOX has relinquished his appointment as Deputy Director of the British Welding Research Association and is joining Messrs. H. J. Enthoven and Sons, Ltd., as Deputy Technical Manager. His new address will be 15 Lime St., London, S.E.3.

MR. H. E. L. FREYTAG, after 15 years in the Information Department of the British Non-Ferrous Metals Research Association, has taken up the post of Information Officer to the British Boot, Shoe and Allied Trades Association, Satra House, Rockingham Rd., Kettering, Northants.

MR. K. S. GANAPATI has been elected an Associate of the Institution of Metallurgists.

PROFESSOR J. NEILL GREENWOOD, Research Professor of Metallurgy at the University of Melbourne and Honorary Corresponding Member to the Council for Australia, will be leaving Australia for England, by sea, early in May. No further surface mail should therefore be sent to him in Australia until his return; correspondence should be addressed to 72 Queen's Park Rise, Brighton, Sussex, to await his arrival.

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MR. A. J. K. HONEYMAN has been appointed Chief Metallurgist, Steel Division, of the Steel Company of Wales. His temporary address is Steel Company of Wales, Ltd., P.O. Box No. 9, Port Talbot.

MR. G. C. H. MATTHEY, after 45 years' service with Messrs. Johnson, Matthey and Co., Ltd., is retiring from the Executive Committee of Directors, but will continue as a member of the General Board of Directors. On 5 January, at the head offices of the Company in Hatton Garden, London, Mr. Matthey received a presentation—in the form of his portrait in oils and that of his favourite horse—subscribed to by the whole of the 3000 employees of the Company, as a mark of the very high respect and esteem in which he is held. The ceremony was attended by nearly 400 representatives of the works and staff, and, despite the difficulties, the horse "Teddy" was also present.

MR. MAURICE J. OLNEY has resigned the post of Metallurgist to the British Thermostat Co., Ltd., Sunbury-on-Thames, and is now engaged in research at the Department of Metallurgy, Cambridge University.

MR. ROGER PEARCE has left the Research Laboratories of the British Aluminium Co., Ltd., Gerrards Cross, to take up an appointment as Metallurgist with the Pressed Steel Co., Ltd., Cowley.

DR. AUSTEN J. SMITH left the Lunkenheimer Co. of Cincinnati, O., U.S.A., on 1 November 1948, to accept an appointment as Associate Professor of Metallurgical Engineering at Michigan State College, East Lansing, Mich.

MR. W. J. THOMAS, Director and General Production Manager of The British Aluminium Company, Ltd., was appointed Assistant Managing Director of that Company as from 1 January 1949.

MR. L. H. WALKER resigned his post with Reynolds Rolling Mills, Ltd., Oldbury, to take up a 1947 Mond Nickel Fellowship. He left England in January 1949 to spend a year in the U.S.A. and Canada, studying light alloy manufacture and research. During his absence, correspondence should be addressed to him at 22 Onslow Terrace, Langley Moor, Durham.

DEATH

The Editor regrets to announce the death of DR. G. C. HOLDER, Metallurgist and Chemist of the Foster Wheeler Corporation, Cartaret, N.J., U.S.A., in September 1948 (just notified).

Note : Will members (in addition to informing the Institute's administrative department of changes of address, occupation, &c.) kindly notify the Editor, *separately*, of all changes of occupation, appointments, awards of honours and degrees, &c., as these matters interest their fellow members.

NEWS OF LOCAL SECTIONS AND ALLIED SOCIETIES

SCOTTISH LOCAL SECTION

Non-Ferrous Metals in Aircraft

On 13 December 1948, in the hall of the Institution of Engineers and Shipbuilders in Glasgow, Mr. G. Meikle, B.Sc., F.I.M., delivered an address on "Non-Ferrous Metals in Aircraft". Mr. John Arnott, F.R.I.C., F.I.M., Vice-Chairman of the Section, presided.

Since the most important non-ferrous metal in aircraft construction is aluminium (including its alloys), Mr. Meikle dealt with this metal at some length. Magnesium alloys were also mentioned, and others—such as those of copper, tin, nickel, cadmium, and zinc—were described where they are used for particular purposes.

For the purposes of the lecture, wrought aluminium alloys were divided into three broad classes, depending on their ultimate tensile stress: (1) up to 15 tons/in.², (2) 15 to 25 tons/in.², and (3) 25 tons/in.² and over. The first group was represented by the 1½% manganese and the 2% magnesium alloys, which are used for low stressed parts. The second group included the 3½%, 5%, and 7% magnesium alloys. The development of high-strength alloys, which constituted the third group, was described at length, starting with the well known Duralumin and ending with the high-strength aluminium-zinc-magnesium alloys. The advantages of cladding sheets was mentioned, together with the attendant disadvantage of slightly reduced strength. The introduction of the artificially-aged alloys of the two distinct types, high-copper and low-copper, was dealt with, and the lecturer covered, in particular, difficulties due to their different solution treatment temperatures. The high-strength copper alloys of the D.T.D. 364 type were then described and, finally, the aluminium-zinc-magnesium alloys. Difficulties in bending and forming high-strength aluminium alloys were briefly dealt with. Aluminium casting alloys—particularly the 12% silicon alloy and the high-strength 4½% copper alloy—were briefly dealt with. The 10% magnesium alloy was described in relation to its use in the Lancaster undercarriage.

Mr. Meikle discussed the corrosion of aluminium alloys with particular reference to the problem of corrosion between dissimilar metals and to the electrode potential developed between such metals in contact in the presence of sea water. Some experiments carried out at the Royal Aircraft Establishment on the measurement of corrosion currents between dissimilar metals were also explained. Stress-corrosion experiments were described.

The effect of heating aluminium alloys to temperatures up to about 400° C. was demonstrated by diagrams showing that at temperatures between 150° and 250° C. the length of time that the alloy is held at temperature has a marked effect on the strength obtained at the elevated temperature.

The work being carried out at the R.A.E. on aluminium alloys of high Young's modulus was described, and the lecturer explained why an improvement in this property would be an advantage.

NEWS AND ANNOUNCEMENTS

A description was given of work being done by the Aeronautical Inspection Department on statistical analysis of mechanical test results, more especially in its relation to fixing specification values.

Magnesium alloys were dealt with briefly, special reference being made to the value of zirconium additions. The advantage of high-purity materials from the corrosion point of view was stressed.

The use of copper alloys for special purposes was mentioned, and the employment of cadmium, zinc, and nickel as protectives against corrosion was described. Finally, a description was given of a small furnace which is used to enable sections to be examined under the microscope while at temperatures up to 550° C.

SOUTH WALES LOCAL SECTION

Films of Metallurgical Interest

At a meeting of the Section held at University College, Swansea, on 11 January 1949, Mr. D. W. Hopkins, M.Sc., occupying the Chair, three films of metallurgical interest were shown.

The first film, entitled "Die-Casting", was loaned by the Imperial Smelting Corporation, Ltd., and opened up with a diagrammatic illustration of the operations of a die-casting machine, followed by the working of a normal production unit. The film well illustrated the actual production of a set of dies, which have to be made to exceedingly fine limits, and concluded by showing how all raw material used was chemically analysed and by displaying several articles which had been die-cast.

The next film, entitled "This is Aluminium", was loaned by the Aluminium Development Association. Details of mining the aluminium ore were followed by diagrammatic illustrations of the conversion of bauxite into aluminium oxide and thence by fusion with cryolite into metallic aluminium. Rolling mills, extrusion presses, and forming machines were shown, together with the several uses for aluminium at the present time.

The last film, loaned by the Zinc Development Association, was on "Galvanizing", and very ably portrayed the methods in use for covering all types of articles with a protective coating of zinc. Details were given of how the articles were prepared, ready for their dipping into molten zinc. The film concluded by showing a variety of articles that had been galvanized.

All three films were of American origin, and are recommended to the other Local Sections.

OTHER NEWS

FOURTH EMPIRE MINING AND METALLURGICAL CONGRESS, GREAT BRITAIN, July 1949

The Second Circular of the Congress, a document of 24 pages, was issued in January 1949. To avoid disappointment, members who wish to attend the Congress must return Reply Form C *not later than 1 March* to the Organizing Secretary, Fourth Empire Mining and Metallurgical Congress, Salisbury House, Finsbury Square, London, E.C.2.

The Circular gives the names of the Organizing Committee,

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Vice-Presidents, and official delegates (as notified to 14 December 1948), and revised details of the programme of the Congress.

NUFFIELD FOUNDATION RESEARCH FELLOWSHIP IN EXTRACTION METALLURGY

The date for the receipt of applications for the Nuffield Foundation Research Fellowship in Extraction Metallurgy has been put forward to 31 March 1949. The Fellowship will be tenable at the Royal School of Mines, London, for a period of up to five years, and the funds available are sufficient to provide a salary of from £1200 to £1500 p.a. for the Fellow, as well as some £2500 p.a. for assistants and apparatus.

Applicants should have had experience in the initiation and development of research, preferably in industrial research establishments, and must put forward an outline of the research which they propose to undertake. No conditions are laid down regarding the nature of the research, provided that it is concerned with extraction metallurgy, but preference will be given to a candidate who proposes to study some problem bearing on the basic scientific principles of metal extraction.

Applications, giving details of the candidate's qualifications and experience, the names of three referees, and an outline programme of research, should be sent to the Secretary, the Institution of Mining and Metallurgy, Salisbury House, London, E.C.2.

LEVERHULME RESEARCH FELLOWSHIPS, 1949

Application is invited for Fellowships and Grants in aid of research. The Fellowships and Grants are intended for senior workers who are prevented by routine duties or pressure of other work from carrying out research. They are limited to British-born subjects normally resident in the United Kingdom. In exceptional circumstances the Trustees may waive the condition as to residence.

The Trustees are also prepared to consider applications from groups of workers engaged upon co-operative programmes of research, particularly from those engaged on long-distance programmes or in institutions in which the normal facilities for research have been curtailed by the war.

The duration of the awards will not normally extend over more than two years or less than three months, and the amount will depend on the nature of the research and the circumstances of the applicant.

Forms of application may be obtained from the Secretary, Dr. L. Haden Guest, M.C., M.P., Leverhulme Research Fellowships, 7 Bedford Row, London, W.C.1. Applications must be received on or before 1 March 1949. Awards will be announced in July and will date from 1 September 1949.

INDUSTRIAL FINISHES EXHIBITION, EARL'S COURT, LONDON, 31 AUGUST TO 13 SEPTEMBER 1949

Initially sponsored by the Council of Industrial Design, the Industrial Finishes Exhibition will bring together, for the first time, all the widely diverse industries, trades, and associations working throughout the field of industrial finishing.

This is not intended to be "just another technical exhibition";

NEWS AND ANNOUNCEMENTS

it is being organized because the industry itself agrees that it is necessary if the design and finish of British goods is to be improved and maintained. The theme of the exhibition will be focused in a central technical exhibit, which will deal impartially with every aspect of finishing. The Council of Industrial Design will itself have a large exhibit emphasizing the design aspect.

The scope of the exhibition covers non-metallic coatings (chemical and electro-chemical finishes, vitreous enamels, and organic finishes); natural finishes and inorganic coatings (natural metal finishes, precious metal platings, base metal platings, dipped and sprayed metal coatings); and ancillary processes and equipment (preparation of metal; plant, equipment, abrasives, &c.).

The exhibition organizers are being assisted by a strong Technical Advisory Committee, under the Chairmanship of Mr. E. A. Ollard, of the British Non-Ferrous Metals Research Association, and many distinguished men of science and industry have accepted invitations to serve on the exhibition's Honorary Advisory Committee, including Lord Lucas, Sir Edward Appleton, Sir Arthur Smout (President of the Institute of Metals), Mr. G. L. Bailey (Director, British Non-Ferrous Metals Research Association), Sir Charles Goodeve (Director, British Iron and Steel Research Association), Mr. Leslie Gamage, Mr. G. W. Preston (Copper Development Association), and Dr. E. G. West (Aluminium Development Association).

Designers and manufacturers have frequently selected finishes which have been quite unsuited to the shape and service conditions of the finished product. Apparent cheapness has too often been a factor in deciding on a type of finish without regard to the effect of price on quality. Some bad finishes have been due to failure to obtain a satisfactory answer to a firm's problems quickly. This exhibition, it is hoped, will bring together the scientist, designer, manufacturer, and user, to their mutual benefit.

Applications for exhibition space should be addressed to 26 Old Brompton Road, London, S.W.7 (Phone: KENSington 0025).

JEWELLERY AND SILVERWARE DEVELOPMENT COUNCIL

As has already been announced, the Chairman of the Jewellery and Silverware Development Council is Mr. Julian Piggott, C.B.E., M.C.

The following additional appointments to be members of the Council are now announced by the Board of Trade: Major Gilbert Dennison, Mr. Roy M. Klean, and Mr. Ivan Shortt, representing employers in the industry; Mr. Arthur J. Raxworthy and Mr. John C. West, representing persons employed in the industry; Mr. J. W. Isaac, as a person having special knowledge of matters relating to marketing or distribution; and Mr. John Austin and Mr. F. S. E. Fawkes as independent members.

Appointments of a further member representing employers and of two members representing persons employed in the industry will be announced in due course.

PHYSICS OF THE SOLID STATE

Sir Lawrence Bragg will deliver a course of four lectures on this subject at the Royal Institution, Albemarle St., London, W.1, on Thursdays, 17, 24, and 31 March and 7 April 1949, at 5.15 p.m. The fee for the four lectures is 8s.

NEWS AND ANNOUNCEMENTS

BIRMINGHAM UNIVERSITY LECTURES ON INDUSTRIAL METALLURGY

During the Spring Term, 1948, a course of lectures for men in executive positions in industry was given at the University by the Industrial Metallurgy Department, entitled "An Introduction to the Theory of Sheet and Strip Rolling and its Application to Industrial Problems". The series of lectures was very well supported, and it was announced that this would be followed by a further series of lectures on a different subject in the Spring Term of 1949.

It was fully intended to arrange this course as announced, but, unfortunately, Professor Aitchison has been seriously ill since last July and will not be able to resume his duties at the University for some time to come. This has given a great deal of additional work to the lecturers of the Department, and in these circumstances it will be impracticable to give the lecture course this session.

It is hoped, however, to resume the courses next session, when Professor Aitchison will have returned to the Department. The subject of the lectures and other arrangements will be announced at a later date.

AMERICAN ELECTROPLATERS' SOCIETY

Research on Current and Metal Distribution in Electroplating

The American Electroplaters' Society recently inaugurated Research Project Number 11 on "Current and Metal Distribution in Electroplating" at Evansville College, Evansville, Indiana. The director of the project will be Dr. John Kronsbein, who is Head of the Department of Engineering.

The experimental work will include the electrodeposition of various common metals on a variety of standard geometric shapes of the types usually encountered in the metal forming and die-casting industries, with varying current densities and bath compositions. The deposits will then be accurately measured for metal thickness. It is hoped that the data obtained will permit the more accurate choice of electroplating conditions to get satisfactory metal distribution on complex geometric shapes.

DIARY FOR MARCH

INSTITUTE MEETING

Annual General Meeting.—Wednesday, Thursday, and Friday, 30 and 31 March and 1 April. For details, see this issue, p. 76.

LOCAL SECTIONS MEETINGS

TUESDAY, 1 MARCH

South Wales Local Section.—Students' Discussion. (University College, Singleton Park, Swansea, at 6.30 p.m.)

NEWS AND ANNOUNCEMENTS

THURSDAY, 3 MARCH

Birmingham Local Section.—D. A. Oliver, "The Technical Significance of the Sigma Phase". (James Watt Memorial Institute, Great Charles St., Birmingham, at 6.30 p.m.)

THURSDAY, 10 MARCH

London Local Section.—Colonel W. C. Devereux. "Structural Uses of Light Metals". (4 Grosvenor Gardens, London, S.W.1, at 7 p.m.)

MONDAY, 14 MARCH

Scottish Local Section.—G. Skript: "Some Thoughts on Organization, Economics, and Good Housekeeping in Non-Ferrous Jobbing Foundries". (Institution of Engineers and Shipbuilders in Scotland, 39 Elmbank Crescent, Glasgow, C.2, at 6.30 p.m.)

THURSDAY, 24 MARCH

Birmingham Local Section.—Films on steel-making and on the manufacture of tungsten carbide. (James Watt Memorial Institute, Great Charles St., Birmingham, at 6.30 p.m.)

FRIDAY, 25 MARCH

Sheffield Local Section.—Annual General Meeting. Films. (Grand Hotel, Sheffield, at 6.30 p.m.)

OTHER MEETINGS

TUESDAY, 1 MARCH

Electrodepositors' Technical Society, Midlands Centre.—O. Wright: "Bearings and the Electrodepositor". Joint meeting with the Coventry Engineering Society. (Old Library Buildings, Broadgate, Coventry, at 6.45 p.m.)

WEDNESDAY, 2 MARCH

Institute of Fuel, Midland Section.—G. H. Jowett and Professor R. J. Sarjant: "Statistical Methods in Fuel Technology". (James Watt Memorial Institute, Great Charles St., Birmingham, at 2.30 p.m.)

Manchester Metallurgical Society.—Annual General Meeting. C. G. Conway, B.Sc.: "Metallurgical Problems Involved in the Manufacture of Components for Jet Engines". (Engineers' Club, Albert Sq., Manchester, at 6.30 p.m.)

National Institute of Industrial Psychology.—P. Dunsheath: "The Utilization of Techniques and Knowledge in Industry". (London School of Hygiene, Keppel St., London, W.C.1, at 6 p.m.)

THURSDAY, 3 MARCH

Institution of Electrical Engineers, Rugby Sub-Centre.—W. J. Pool: "Electricity in the Modern Rolling Mill". Joint meeting with the Rugby Engineering Society. (Electricity Showrooms, Rugby, at 6.30 p.m.)

NEWS AND ANNOUNCEMENTS

Leeds Metallurgical Society.—F. W. Colbeck: "Metallurgical Problems in the Field of Atomic Energy". (Chemistry Dept., The University, Leeds 2, at 7 p.m.)

Liverpool Metallurgical Society.—Dr. C. J. Smithells, M.C.: "Practical Significance of Solution and Diffusion of Gases in Metals". Illustrated by colour films. (Liverpool Engineering Society, 9 The Temple, 24 Dale St., Liverpool, at 7 p.m.)

SATURDAY, 5 MARCH

Institute of British Foundrymen, Lancashire Branch.—J. J. Sheehan: "Some Further Notes on Core Shop Control". (Engineers' Club, Albert Sq., Manchester, at 3 p.m.)

Institute of British Foundrymen, West Riding of Yorkshire Branch.—E. Longden: "Problems of Contraction and Distortion in Cast Iron Castings". (Technical College, Bradford, at 6.30 p.m.)

WEDNESDAY, 9 MARCH

Institute of Fuel, North-Western Section.—P. D. Kirkman: "The Efficient Use of Fuel". Joint meeting with the National Smoke Abatement Society. (Engineers' Club, Albert Sq., Manchester, at 2 p.m.)

THURSDAY, 10 MARCH

Chemical Society.—Dr. E. A. Moelwyn-Hughes: "The Liquid State". (Joint meeting with the University College of Wales Chemical Society. (Edward Davies Chemical Laboratories, Aberystwyth, at 5 p.m.)

Institute of British Foundrymen, East Anglian Section.—A paper by J. W. Gardom. (Central Library, Ipswich, at 7 p.m.)

Institute of British Foundrymen, Lincoln Section.—J. F. Barnes and F. E. Ironmonger: "Making a Large Eight Cylinder Diesel Crankcase". (Lincoln Technical College, at 7.15 p.m.)

Institute of Physics, Midland Branch.—Dr. R. A. Hull, "Recent Work at Very Low Temperatures". (Imperial Hotel, Birmingham, at 6.30 p.m.)

Institute of Welding.—J. T. Phillips and F. J. Daniels: "Welded Steel Frame Buildings". Joint meeting with the Institution of Structural Engineers. (11 Upper Belgrave St., London, S.W.1, at 6 p.m.)

Institute of Welding, South London Branch.—The Reclamation of Worn Surfaces. I.—"Electrodeposition", by R. A. Hammond. II.—"Metal Spraying", by R. Dickinson. III.—"Welding", by B. R. Byrne. (Institute of Marine Engineers, 85-88 The Minories, London, E.C.3, at 6.30 p.m.)

Institution of Works Managers.—F. W. Doxey: "Industrial Safety". (Rest Hotel, Kenton, Wembley, at 12.30 p.m.)

NEWS AND ANNOUNCEMENTS

FRIDAY, 11 MARCH

Institute of British Foundrymen, Middlesbrough Branch.—F. Gottfeld: "Radiography". (Cleveland Scientific and Technical Institute, Corporation Rd., Middlesbrough, at 7.30 p.m.)

Institute of British Foundrymen, Scottish Branch.—J. F. Dowell and — Hal: "Work in a Jobbing Foundry". (Royal Technical College, George St., Glasgow, at 3 p.m., followed by Annual Dinner at the Grosvenor Restaurant.)

SATURDAY, 12 MARCH

Institute of British Foundrymen, Newcastle Branch.—Visit to the Darlington and Spennymoor Works of Thos. Summerston and Sons, Ltd.

MONDAY, 14 MARCH

Institute of British Foundrymen, Sheffield Branch.—A. T. Green and Dr. G. R. Rigby: "Refractory Materials in the Foundry Industry". (Royal Victoria Hotel, Sheffield, at 7.30 p.m.)

WEDNESDAY, 16 MARCH

Institute of Fuel, Yorkshire Section.—J. B. M. Mason and L. Clegg: "Heat and Power Targets for Industry". (Royal Victoria Hotel, Sheffield, at 3 p.m.)

Institute of Physics, South Wales Branch.—Dr. A. J. Maddock, "Magnetic Amplifiers". Joint meeting with the Society of Instrument Technology. (University College, Cardiff, at 5 p.m.)

Institute of Welding, North London Branch.—C. A. Burton: "Development in the Technique of Resistance Welding". (South-West Essex Technical College, Walthamstow, London, E.17, at 7.30 p.m.)

Institute of Welding, West of Scotland Branch.—Dr. H. Harris and J. Jones: "The Application of Welding for High-Pressure and High-Temperature Equipment". (39 Elmbank Crescent, Glasgow, C.2, at 7 p.m.)

THURSDAY, 17 MARCH

Institute of Fuel, East Midland Section.—A. D. Cummings: "A History of Fuel Technology". (Gas Demonstration Theatre, Nottingham, at 6 p.m.)

Institute of Production Engineers.—Dr. H. Orenstein: "Production Research in America". (Institution of Engineers and Shipbuilders in Scotland, 39 Elmbank Crescent, Glasgow, C.2, at 7.30 p.m.)

Institution of Mining and Metallurgy.—General Meeting. (Geological Society, Burlington House, London, W.1, at 5 p.m.)

Royal Society.—Election of Fellows, followed by reading and discussion of papers, including W. E. Garner, T. J. Gray, and F. S. Stone: "The Oxidation of Copper and the Reactions of Hydrogen and Carbon Monoxides with Copper Oxide". (Burlington House, Piccadilly, London, W.1, at 4.15 p.m.)

NEWS AND ANNOUNCEMENTS

FRIDAY, 18 MARCH

Institute of British Foundrymen, Falkirk Section.—Annual Business Meeting. (Temperance Café, Lint Riggs, Falkirk, at 7 p.m.)

West of Scotland Iron and Steel Institute.—R. P. Towndrow : “ Factors Affecting the Quality of Pig Iron ”. (39 Elmbank Crescent, Glasgow, C.2, at 6.45 p.m.)

SATURDAY, 19 MARCH

Institute of British Foundrymen, Bristol Branch.—Short Paper Prize Scheme. (Grand Hotel, Broad St., Bristol, at 3 p.m.)

MONDAY, 21 MARCH

Institute of Welding, South London Branch.—Annual Dinner. (Charing Cross Hotel, London, W.C.2.)

TUESDAY, 22 MARCH

Institute of British Foundrymen, Slough Section.—Visit (p.m.) to the Fulmer Research Institute, Stoke Poges, Bucks.

Institution of Electrical Engineers, North-Western Centre.—Dr. G. H. Tupling : “ The Early Metal Trades and the Beginnings of Mechanical Engineering in Lancashire ”. (Engineers’ Club, Albert Sq., Manchester, at 7 p.m.)

WEDNESDAY, 23 MARCH

Geological Society of London.—Ordinary Evening Meeting. (Burlington House, Piccadilly, London, W.1, at 5 p.m.)

Institute of British Foundrymen, Birmingham Branch.—Debate on “ Naturally-Bonded versus Synthetic Sand ”, initiated by J. J. Sheehan and W. B. Parkes. (James Watt Memorial Institute, Great Charles St., Birmingham, at 7 p.m.)

THURSDAY, 24 MARCH

British Institute of Management.—Sir Ewart Smith : “ The Measurement of the Effectiveness of the Industrial Unit ”. (Conway Hall, Red Lion Square, London, at 5.30 p.m.)

FRIDAY, 25 MARCH

Electrodepositors’ Technical Society, Sheffield and North-East Centre.—A. F. Brockington : “ Bright Nickel Plating ”. (Grand Hotel, Sheffield, at 6.30 p.m.)

Institute of British Foundrymen, London Branch.—Dinner. (Criterion Restaurant, Piccadilly Circus, London, W.1, at 7 p.m.)

Institute of British Foundrymen, West Wales Section.—E. Longden : “ Some Problems of Contraction and Distortion in Ferrous Castings ”. (Glanmor Foundry Canteen, Llanelly, at 7 p.m.)

Institute of Fuel, Scottish Section.—R. P. Towndrow : “ Blast-Furnace Practice ”. (Institute of Engineers and Shipbuilders in Scotland, 39 Elmbank Crescent, Glasgow, C.2, at 6 p.m.)

NEWS AND ANNOUNCEMENTS

SATURDAY, 26 MARCH

Institute of British Foundrymen, Bristol Branch.—D. F. Tedds :
“Lost Wax Process”. (Exeter.)

Institute of British Foundrymen, East Midlands Branch.—
Annual Meeting, followed by a Short Paper Competition. (School
of Arts and Crafts, Derby, at 6 p.m.)

Institute of British Foundrymen, Wales and Monmouthshire
Branch.—Annual Meeting. Visit to the Branch by the National
President and Institute Secretary. (Angel Hotel, Cardiff.)

MONDAY, 28 MARCH

Institution of Works Managers, Glasgow Branch.—G. F. Satow :
“The Supervisory Grades as a Link between Management and
Men”. (Institution of Engineers and Shipbuilders in Scotland,
39 Elmbank Crescent, Glasgow, C.2, at 7 p.m.)

TUESDAY, 29 MARCH

Institution of Works Managers.—F. E. Chappell : “Foreman-
ship”. (College of Art and Technology, Leicester, at 7 p.m.)

WEDNESDAY, 30 MARCH

Institute of British Foundrymen, London Branch.—W. W.
Braidwood : “What is Acicular Cast Iron?” (Waldorf Hotel,
Aldwych, London, W.C.2, at 7.30 p.m.)

Institution of Structural Engineers, Midland Counties Branch.—
Annual General Meeting. Film, in full colour and sound :
“Design for Arc Welded Structures”. (James Watt Memorial
Institute, Great Charles St., Birmingham, at 7 p.m.)

APPOINTMENTS VACANT

*To conform to the requirements of the Control of Engagements Order,
1947, these advertisements are published for the information only of
those who are “excepted persons” under the Order.*

CHEMIST required in Metallurgical Laboratory in North London to undertake assaying of base metals, ores, concentrates, and residues, including tungsten. Reply giving full details experience and salary required. Box No. 256, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

ELECTRO-CHEMIST required, with good degree, for research on corrosion and protection. Age 25–35. State age, qualifications, experience, salary required, to T.I. (Group Services), Ltd., Dept. of Development & Research, Plume Street, Aston, Birmingham.

LONDON METALLURGICAL SOCIETY requires Senior Editorial Assistant (male) for its publications department. Applications are invited from graduates under 28 years of age, with a knowledge of German. Previous editorial experience is not necessary. Salary according to qualifications. Reply to Box No. 257, Institute of Metals, 4 Grosvenor Gardens London, S.W.1.

METALLURGICAL CHEMIST wanted for smelting works in Singapore. B.Sc. or equivalent qualification. Salary according to age and experience. Write Box I.N.W., c/o 95 Bishopsgate, London, E.C.2.

METALLURGIST required for light engineering company in West London area. Applicants should possess a University degree or equivalent qualification and considerable experience of pressure die-casting. Experience of general works metallurgical problems an advantage. Reply, giving age, qualifications, and experience, to Box No. 255, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

METALLURGISTS with good degrees for research on light alloys. Age (a) about 30–35; (b) about 25. State age, qualifications, experience, salary required, to T.I. (Group Services), Ltd., Dept. of Development & Research, Plume Street, Aston, Birmingham.

NEWS AND ANNOUNCEMENTS

MILITARY COLLEGE OF SCIENCE, SHRIVENHAM, NEAR SWINDON, WILTS. Applications are invited from men only for the temporary post of Metallurgy Demonstrator at the Military College of Science, Shrivenham, Near Swindon, Wilts., under the War Office. Details of the vacancy together with qualifications required are as follows: F.707/48A *Metallurgy*. The Demonstrator will be required to assist in instructional and experimental work in the metallurgy laboratory. Candidates should possess a University degree in metallurgy or an equivalent qualification, together with some practical experience. Candidates should not have been more than 25 years old on 1 August 1948. The inclusive London salary range is £230-490; the range will be slightly lower for employment outside the London postal area. The initial salary will be fixed in accordance with qualifications and experience. There will be opportunities for private study and research, and Demonstrators will be encouraged and assisted to work for higher degrees or other qualifications. The College is recognized by the University of London as an institution for the B.Sc. Degree course, and facilities exist for post-graduate work. Single quarters are available at the College, and every assistance will be given in finding accommodation for married men. Write, quoting the appropriate reference number (F.707/48A), to Ministry of Labour and National Service, Technical and Scientific Register (K), York House, Kingsway, London, W.C.2, for application form, which must be returned completed by 5 March 1949.

MITCHAM WORKS, LIMITED, require **SENIOR METALLURGIST** for development work on arc welding. Experience in metallurgy of general fabrication processes would be a recommendation. Age over 26 years. Salary according to qualifications and experience. Write for application form to Works Personnel Officer, Mitcham Works, Limited, New Road, Mitcham Junction, Surrey, quoting the reference "MI/7".

MITCHAM WORKS, LIMITED, require **SENIOR PHYSICAL METALLURGIST** for research work on permanent magnet alloys. Applicants should have a degree in physical metallurgy or physics with some years' experience in metallurgical work. Salary according to age and experience. Apply to the Works Personnel Officer, Mitcham Works, Limited, New Road, Mitcham Junction, Surrey, for an application form, quoting the reference "MI/8".

SENIOR METALLURGIST, aged 30-45, with degree or equivalent qualification and industrial experience, required by long established heavy non-ferrous foundry in the North-West. Salary according to qualifications, but approximately £1000 p.a. Accommodation available. Box No. 253, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

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BULLETIN ANALYTIQUE

Publication of the Centre National de la Recherche Scientifique, France

The *Bulletin Analytique* is an abstracting journal which appears monthly in two parts, Part I covering scientific and technical papers in the mathematical and physical sciences and their applications, Part II the biological sciences.

The *Bulletin*, which started on a modest scale in 1940, with an average of 10,000 abstracts per part, now averages 35,000 to 45,000 abstracts per part. The abstracts summarize briefly papers in scientific and technical periodicals received in Paris from all over the world, and cover the majority of the more important journals in the world scientific press. The scope of the *Bulletin* is constantly being enlarged to include a wider selection of periodicals.

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Subscriptions can be paid directly to the editors: Centre National de la Recherche Scientifique, 18 rue Pierre-Curie, Paris 5ème. (Compte-chèque-postal 2500-42, Paris), or through Messrs. H. K. Lewis & Co., Ltd., 136 Gower St., London, W.C.1.

THE INSTITUTE OF METALS

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INSTITUTE NEWS AND ANNOUNCEMENTS

HONORARY CORRESPONDING MEMBER TO THE COUNCIL FOR AUSTRALIA

Professor J. NEILL GREENWOOD, D.Sc., Met.E., who has acted as Honorary Corresponding Member to the Council for Australia has, after 23 years' service to the Institute in that capacity, resigned the office, and the Council has accepted his resignation with much regret. On its behalf, the President has expressed to Professor Greenwood the Council's deep appreciation of the services that he has rendered to the Institute as its representative in Australia.

Professor H. K. WORNER, D.Sc., Professor of Metallurgy at the University of Melbourne, has accepted an invitation to act as Honorary Corresponding Member to the Council for Australia.

CONSTITUTIONAL DIAGRAMS

Many members who possess copies of Dr. Haughton's "Bibliography of the Literature Relating to the Constitutional Diagrams of Alloys" do not appear to possess copies of Supplement No. 1 (1944), the price of which is 9d. to non-members and 5d. to members, post free. Copies may still be obtained from the Secretary.

ELECTION OF ORDINARY MEMBERS AND STUDENT MEMBERS

The following 31 Ordinary Members and 31 Student Members were elected on 22 February 1949 :

As Ordinary Members

ALEXANDER, Ben H., B.S., M.S., D.Sc., Metallurgical Engineer, Sylvania Electric Products, Inc., Bayside, Long Island, N.Y., U.S.A.

BAGGOTT, Eric Raymond, B.Sc., Chief Chemist, William Bate, Ltd., Hospital Street, Walsall, Staffordshire.

BASSETT, M.D., B.Sc., Technical Assistant (Light Alloys), Imperial Chemical Industries, Ltd., Metals Division, Waunarlwydd, near Swansea, Glamorganshire.

NEWS AND ANNOUNCEMENTS

- BIBBY, Harry, A.M.C.T., Machine Designer, Howard and Bul-
lough, Ltd, Accrington, Lancashire.
- BROMFIELD, Thomas Sidney, Managing Director, H. B. Partners,
Engineers, 17 May Street, London, W.14.
- BURDEN, Haldon, B.Sc., Manager, Carbide Research and Develop-
ment, Firth-Brown Tools, Ltd., Sheffield.
- DANIEL, Gethin Rowland, Director and Group Works Manager,
National Smelting Company, Ltd., Avonmouth, Bristol.
- DEDRICK, John H., Sc.D., Section Head, Advanced Development
Section, Metallurgical Research Laboratories, Sylvania Elec-
tric Products, Inc., Bayside, Long Island, N.Y., U.S.A.
- EVANS, Arthur, Manager (Light Alloy Sheet and Strip Rolling),
Imperial Chemical Industries, Ltd., Metals Division, Wau-
narlwydd, near Swansea, Glamorganshire.
- GHOSH, Nirmal Kanti, Foreman, Steel Foundry, Nisco, Belur,
India.
- GRIFFITHS, Harry, Assistant Chief Metallurgist, Research Depart-
ment, Vickers Armstrong, Ltd. (Supermarine), Hursley Park,
Winchester, Hampshire.
- HARRIS, Geoffrey Bastion, B.A., Scientific Officer, Metallurgy
Division, National Physical Laboratory, Teddington, Mid-
dlesex.
- HEALEY, Gordon Norman, Head of Constructional Engineering
Department, Roan Antelope Copper Mines, Ltd., Selection
Trust Building, Mason's Avenue, London, E.C.2.
- HULME, Henry Cecil, Works Manager, Imperial Chemical Indus-
tries, Ltd., Metals Division, Wau-narlwydd, near Swansea,
Glamorganshire.
- HUTCHINGS, Felix Roy, Metallurgist, W. H. Allen, Sons and
Company, Ltd., Queen's Engineering Works, Bedford.
- LADLEY, Alexander Stephen, Works Director, National Meter
Company, Ltd., 22 Old Queen Street, London, S.W.1.
- MURISON, Joseph Herbert, Assistant Chief Accountant, Imperial
Smelting Corporation, Ltd., 37 Dover Street, London, W.1.
- OAKLEY, Derek Percy, Technical Director, Cindal Aluminium,
Ltd., San Paolo Works, Mount Street, Nechells, Birmingham.
- OLDRIDGE, Leslie Edgar, Commercial Manager, Imperial Smelt-
ing Corporation, Ltd., 37 Dover Street, London, W.1.
- OWEN, John Webber, Assistant Technical Officer (Chemical),
Imperial Chemical Industries, Ltd., Metals Division, Wau-
narlwydd, near Swansea, Glamorganshire.
- PETERSON, Robert Morits, B.Sc., E.M., Technical Director,
Mufulira Copper Mines, Ltd., and Roan Antelope Copper
Mines, Ltd., Selection Trust Building, Mason's Avenue,
Coleman Street, London, E.C.2.
- RUTTER, Douglas Webb, A.R.S.M., Mining Engineer, Roan Ante-
lope Copper Mines, Ltd., Selection Trust Building, Mason's
Avenue, Coleman Street, London, E.C.2.
- SMITH, R. B., B.S., Ch.E., Metallurgical Engineer, Reynolds
Metals Company, 2500 South Third Street, Louisville, Ky.,
U.S.A.
- SMITH, Stuart Leslie, B.Sc., Technical Officer (Metallurgist),
Imperial Chemical Industries, Ltd., Metals Division, Wau-
narlwydd, near Swansea, Glamorganshire.
- SYRÉN, Carl-Gustaf Erik, Chief Foundry Engineer, Aktiebolaget
Nordiska Armaturfabrikerna, Linköping, Sweden.

NEWS AND ANNOUNCEMENTS

- THOMAS, Morgan George, Chief Inspector, Imperial Chemical Industries, Ltd., Metals Division, Wau-narlwydd, near Swansea, Glamorganshire.
- THOMPSON, John G., B.Chem., Ph.D., Chief, Metallurgy Division, National Bureau of Standards, Washington 25, D.C., U.S.A.
- WELLARD, Roger, Ing.chim., Dr.-es-Sci., Chef, Centre d'Études, Société Nationale d'Études et de Construction de Moteurs d'Avions, 22 Quai Gallieni, Suresnes (Seine), France.
- WRIGHT, Professor Edwin Chester, M.S., Chem.Eng., Head, Department of Metallurgical Engineering, University of Alabama, Ala., U.S.A.
- YOUNG, John Arthur, Development Engineer, Morris Motors, Ltd., Radiators Branch, Woodstock Road, Oxford.
- ZIEGFELD, Robert Lindley, B.S., Secretary-Treasurer, Lead Industries Association, 420 Lexington Avenue, New York 17, N.Y., U.S.A.

As Student Members

- AGARWAL, Prabhu Lal, B.Sc., Assistant Professor of Metallurgy, College of Mining and Metallurgy, Benares Hindu University, U.P., India.
- AGARWAL, Visheshwer Dayal, B.Sc., Student of Metallurgy, Benares Hindu University, U.P., India.
- BARNES, Allan Francis Charles, Student of Metallurgy, Royal School of Mines, South Kensington, London, S.W.7.
- BATES, Harold, Student of Metallurgy, University of Manchester.
- BILLINGTON, Jack Charles, Student of Metallurgy, Royal School of Mines, South Kensington, London, S.W.7.
- BRIDGSTOCK, Guy, Student of Metallurgy, Royal School of Mines, South Kensington, London, S.W.7.
- CALVER, Arthur Granville, Student of Metallurgy, Royal School of Mines, South Kensington, London, S.W.7.
- CHATTOPADHYAY, Nirendra Nath, Student of Metallurgy, Benares Hindu University, U.P., India.
- COLLINS, Donald Louis William, Student of Metallurgy, Royal School of Mines, South Kensington, London, S.W.7.
- DAVIES, Noel, Student of Metallurgy, University College, Swansea, Glamorganshire.
- DUNNING, Alan, Student of Metallurgy, Royal School of Mines, South Kensington, London, S.W.7.
- HOLGATE, John Kedson, Student of Metallurgy, Royal School of Mines, South Kensington, London, S.W.7.
- HUGHES, Vernon Thomas, Technical Assistant (Light Alloys), Imperial Chemical Industries, Ltd., Metals Division, Wau-narlwydd, near Swansea, Glamorganshire.
- MARSH, Kenneth J., B.Sc., Research Bursar, British Non-Ferrous Metals Research Association, Euston Street, London, N.W.1.
- MATTHEWS, Robert John, Student of Metallurgy, Royal School of Mines, South Kensington, London, S.W.7.
- MONCRIEFF, A. Gavin, B.A., Student of Metallurgy, Royal School of Mines, South Kensington, London, S.W.7.
- MUIR, George A., Sales Clerk, Imperial Chemical Industries, Ltd., Metals Division, Rutherglen, Glasgow.
- PALME, Richard B., S.M., Research Associate, Mechanical Engineering Department, Massachusetts Institute of Technology, Cambridge 39, Mass., U.S.A.

NEWS AND ANNOUNCEMENTS

- RAMAGE, Stanley James, Student of Metallurgy, Royal School of Mines, South Kensington, London, S.W.7.
- ROBB, Nicholas, Student of Metallurgy, Royal School of Mines, South Kensington, London, S.W.7.
- ROBINSON, Alan Jeffery, Student of Metallurgy, Royal School of Mines, South Kensington, London, S.W.7.
- SLANEY, John Samuel, D.F.C., Student of Metallurgy, Royal School of Mines, South Kensington, London, S.W.7.
- * SMITH, Ernest Howard, Assistant Chief Metallurgist, Coventry Gauge and Tool Company, Ltd., Fletchamstead, Coventry.
- TAYLOR, Brian, Student of Metallurgy, Royal School of Mines, South Kensington, London, S.W.7.
- TOWNEND, Norman Hubert, Student of Metallurgy, Royal School of Mines, South Kensington, London, S.W.7.
- THOMAS, L. T. O., Student of Metallurgy, Birmingham University.
- UBANK, Raymond George, Metallurgical Research Assistant, Bristol Aeroplane Company, Ltd., Bristol.
- WALKER, Francis Ernest, Student, University College, Swansea, Glamorganshire.
- WEBB, Leonard Eric, Student of Metallurgy, Royal School of Mines, South Kensington, London, S.W.7.
- WILLIAMS, William Malcolm, B.Sc., Bursar, British Non-Ferrous Metals Research Association, Euston Street, London, N.W.1.
- WILSON, Alan Leslie, Student of Metallurgy, University of Sheffield.
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PERSONAL NOTES

PROFESSOR J. H. ANDREW has been awarded the Bessemer Gold Medal of the Iron and Steel Institute for 1949.

MAJOR C. J. P. BALL left England on 18 March for a visit to the United States.

MR. E. G. BAYLISS has discontinued his association with Forgings and Presswork, Ltd., and is now Chief Metallurgist at the Bromsgrove Works of John Garrington and Sons, Ltd.

MR. N. BEZBORA has left this country for India. His address is c/o The National Bearing Company, Ltd., Jaipur (Rajputana), India.

MR. W. F. BRAZENER has been elected Chairman of the Cold Rolled Brass and Copper Association.

MR. GEOFFREY T. CALLIS has resigned his position with J. Stone and Company, Ltd., and has been appointed Chief Metallurgist to the Manganese Bronze and Brass Company, Ltd., Birkenhead.

MR. S. C. CLIFFORD has resigned his post as Chief Chemist and Metallurgist to Humber, Ltd., Coventry, and has taken up an appointment with John Garrington and Sons, Ltd., as Quality Manager. Mr. Clifford was recently elected a Fellow of the Institution of Metallurgists.

MR. F. C. EVANS, formerly General Manager of Langley Alloys, Ltd., has joined the firm of John Miles and Partners (London), Ltd., Consulting Engineers in the Iron and Steel and Non-Ferrous Industries.

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MR. D. FAGG has joined the staff of the Liaison Department of the British Non-Ferrous Metals Research Association.

MR. P. T. GILBERT has been elected an Associate of the Institution of Metallurgists.

MR. A. T. GREEN has been appointed Director of Research of the British Ceramic Research Association, Stoke-on-Trent.

MR. D. W. HALL has been elected an Associate of the Institution of Metallurgists.

MR. J. V. HARDING has left Philips Electrical Company, Ltd., and has taken up an appointment with the International Meehanite Metal Company.

MR. RAYMOND HAYNES has been awarded the George Senior Research Fellowship in Metallurgy. He is now carrying out research at Sheffield University.

MR. W. K. B. MARSHALL has taken up an appointment as Assistant Director of Research of the British Welding Research Association. Mr. Marshall was for some years Works Metallurgist at the Milton Works of The British Aluminium Company, Ltd., and for the past eight years has been Chief Metallurgist and later Chief Development Engineer to the A.P.V. Company, Ltd., Wandsworth, London. Mr. Marshall is a graduate of Liverpool University; in his new position he will pay particular attention to the non-ferrous welding investigations of the Association's programme.

DR. PAUL D. MERICA, who has been Vice-President since 1936 and a Director, has been appointed Executive Vice-President of the International Nickel Company of Canada, Ltd.

MR. D. P. C. NEAVE has been appointed a Director of the Consolidated Zinc Corporation, Ltd.

SIR ARTHUR SMOUT has accepted an invitation to be a member of the Honorary Advisory Council of the Industrial Finishes Exhibition, 1949, representing the Institute of Metals.

MR. ROBERT C. STANLEY has retired as President of the International Nickel Company of Canada, Ltd., but remains Chairman of the Board.

MAJOR P. L. TEED has received, and accepted, an invitation to lecture in New York, in May, to the Institute of Aeronautical Sciences on "Materials from the Manufacturer's Point of View". He has also been invited by the Secretary-General of the United Nations to take part in a Symposium at Lake Success on the utilization and conservation of materials. At that meeting he is contributing a paper on "Magnesia and Magnesium from Sea-Water".

MR. D. A. TEMPLE has been awarded a Nuffield Post-Graduate Travelling Scholarship for 1949, to enable him to visit plants and laboratories engaged in the extraction of the rarer metals. He plans to travel to the U.S.A. and Canada at the end of the present year.

DR. JOHN F. THOMPSON, who has been Executive Vice-President since 1936 and a Director and member of the Executive Committee since 1931, has been appointed President of the International Nickel Company of Canada, Ltd.

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MR. R. T. F. WATERS is now on the staff of the English Electric Company, Ltd.

MR. TREMBATH WATSON, Works Metallurgist of the Clyde Engineering Company, Ltd., Granville, N.S.W., Australia, since 1942, has resigned that position and accepted an appointment as Chief Metallurgist with Associated Technical Services, Consulting Metallurgists, of Sydney. Before joining the Clyde Engineering Company, Ltd., Mr. Watson was with Stewards and Lloyds, Ltd., at their Newcastle works.

NEWS OF LOCAL SECTIONS AND ASSOCIATED SOCIETIES

BIRMINGHAM LOCAL SECTION

Symposium on Techniques of Metallurgical Examination

A very successful all-day Symposium on "Techniques of Metallurgical Examination" was held at the Chamber of Commerce, Birmingham, on Friday, 18 February 1949. The President of the Institute, Sir Arthur Smout, J.P., was present at the opening Session, when he was welcomed by Mr. R. Chadwick, M.A., Chairman of the Local Section.

The morning session, devoted to "Mechanical Testing", was presided over by Mr. R. Chadwick. In the afternoon, Mr. H. H. Symonds took the chair at a session on "Metallography: The Microscope", and Mr. E. H. Bucknall, M.Sc., presided at the closing session on "Metallography: Other Aspects". There were interesting discussions after the presentation of the papers, summaries of which are printed below. The Symposium was attended by over 200 members and visitors, and the organizers are to be congratulated on the success of this venture, which was an ambitious one for a Local Section.

The Electrical Resistance Wire Strain-Gauge as Applied to Mechanical Testing. By R. T. Budd, B.Sc., and R. J. Parker.

Determination of strain by measurement of associated changes in the electrical resistance of a conductor is established practice. The relationship between strain and resistance change is practically linear over a considerable range, and has made possible the use of resistance wire strain-gauges in stress analysis, load measurement, &c. Appropriate techniques for the application of strain-gauge units have been extensively developed, and many have been discussed in the literature of the subject.

Certain essential features are generally recognized, and these were discussed in the present paper. For example, the importance of obtaining a firm bond between the strain-sensitive wire and test specimen was emphasized, and details were given of a satisfactory cementing technique, using a high-solid-content cellulose base adhesive, for use at room temperature. Attention was directed to possible sources of error associated with the use of

resistance wire strain-gauges, and methods of eliminating or reducing these effects are indicated.

For measurement purposes, the Wheatstone bridge circuit is almost universally adopted, using either the null point or deflection methods, the latter depending on determination of the out-of-balance current caused by a change of resistance in one of the bridge arms. A description was given of a commercial instrument of the deflection type which can easily be adapted to measure strain at a number of points.

Certain features of resistance wire strain-gauges, however, such as sensitivity, low mechanical inertia, flexibility, and independence of strain indication relative to gauge-length, render them ideal for application to mechanical testing. Accuracy and reproducibility of results from strain-gauges have been checked in tension and compression by a special cathetometer, tests being carried out on specimens machined from material having a low elastic modulus and high limit of proportionality and, therefore, a capacity for large elastic strain. These experiments indicated that strains up to 0.005 in./in. can be measured satisfactorily, the maximum variation of results being less than 2.5%.

Resistance wire strain-gauges have subsequently been used in a number of aspects of mechanical testing. For example, the elastic properties of very thin materials cannot be determined accurately by conventional mirror and dial gauge extensometers, but wire strain-gauges have been satisfactorily used to establish load-extension characteristics on material only 0.004-0.008 in. thick.

Further, commercial gauges of very small effective length are obtainable, and units only about 0.3 in. long have been successfully employed in the calibration of the dynamometer springs of machines for fatigue testing strip specimens. For this purpose the gauge was mounted on the central and therefore most highly stressed portion of the fatigue test-piece, but, since the average strain only could be measured, a mathematical correction was applied to determine the maximum strain for comparison with theoretical values. These short gauges have also been used to establish modulus of elasticity values in compression, the tests being carried out on cylindrical specimens only $\frac{5}{8}$ in. high and $\frac{5}{8}$ in. in diameter.

A simple extension measuring attachment for use with a high temperature extensometer is also described. This arrangement, which is sensitive to 10^{-4} in., involves the use of strain-gauges mounted on thin flexible strip springs, and enables extensions as large as 0.04-0.05 in. to be measured with certainty.

Mechanical Testing at High Temperature. By H. E. Gresham.

The author dealt with the following aspects of the subject, viz. : (1) Moderate-life creep testing ; (2) short-time stress-rupture testing ; (3) high-temperature fatigue testing ; and (4) high temperature corrosion-fatigue testing.

The important factors common to creep testing of any type are accurate control and knowledge of the temperature of the specimens, the load to which they are subjected, and the extension of the gauge-length. The most difficult thing to control is, of course, the temperature, and, since it is common to carry out testing at temperatures in the region of 800°-1000° C., it is not an easy proposition.

The first stage of this temperature control problem is the pro-

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vision of a furnace which will heat the specimen to a uniform temperature. For temperatures up to 500°C ., this can be done very conveniently by an air bath, but for temperatures above 500°C . specially wound furnaces are necessary. It is now quite common to obtain a maximum variation of less than 1°C . on a 4 in. gauge-length at 700°C .

The favourite method for maintaining a constant temperature is the use of electronic devices. By such means it is possible to work with a maximum range of $\pm 0.25^{\circ}\text{C}$. over long periods of time.

If the expense of the electronic controller is not justified, mechanical regulators will control to $\pm 1.5^{\circ}\text{C}$. Extensometers used are of the double mirror type, and have been improved in design. It has been necessary to make the limbs in the furnace of a channel section in order to enable them to stand up to temperatures of 750°C . and above.

The advent of the gas turbine engine has brought a new outlook to bear on creep testing, and this has given rise to a certain amount of popularity in the metallurgical world for stress-rupture testing. Certain types of aero engines do not require the length of life necessary for other engineering projects, and this factor has led to the development of a very simple machine. The test-specimen is a standard $1/40$ sq. in. tensometer bar with screwed ends. The grips for holding it are solid except for the tapped holes into which the specimen screws. The ends of the grip opposite to the specimen are hooked to three or four chain links, thus providing an adequate universal joint. The loading is by dead weight. To the specimen are attached two thermocouples, one at each end of the gauge-length. The specimen is lowered or raised in the furnace until the thermocouples give the same reading. No extensometer is fitted. The furnace is specially wound. This stress-rupture test is an excellent tool for routine control of material.

High-temperature fatigue testing has been a subject of interest for a number of years, but even now the majority of machines are rather cumbersome in use. A machine has been developed which is fairly simple to use and gives reproducible results. The specimen is of the small Krouse type, being about 2 in. in length over-all. It is held in a split collet at either end. This split collet is in turn gripped by a ring of material which has a lower coefficient of thermal expansion than the collet material. The collets are integral with prolongs which protrude from the furnace, one being attached to the driving and locating mechanism, and the other to the loading device. Temperature is measured by a thermocouple which is placed very close to, but not actually touching, the specimen. A method of measuring temperature is being developed which utilizes an induction pick-up from a thermocouple attached to the specimen.

Corrosion-fatigue is investigated on a similar type of machine, in which provision is made for leading the corroding gases over the gauge-length of the specimen.

Life Testing of Engine Components. By S. T. Harrison

Much work of this type is carried out during the development of engines, and examples were given which arose in the development of a propeller gas-turbine engine.

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The value of the testing techniques must be assessed on the usefulness of the results. Results which are not available in time are useless, and simplicity is frequently a fundamental consideration. When a component is tested outside its engine context, the conditions are inevitably altered. The actual operating conditions can often be described only in terms of many variables and, as it is not usually desirable to reproduce all these variables in the testing machine, their relative importance and the effect of their interaction must first be considered. Machines designed to reproduce engine conditions exactly are often over-elaborate and tend to give results of doubtful meaning. It is unwise to base a testing procedure on theoretical premises unless these have been checked by engine-running experience. If possible, the usefulness of the results should also be checked in the same way at an early stage.

If a component is liable to fail by several completely different mechanisms (e.g. fatigue, wear, and seizure), it is usually desirable to separate the different effects and to test them separately by strengthening the component against specific types of failure in a way that would not be permissible in actual engines, or by weakening it to induce a certain failure. In such cases the results will require careful consideration, and cross checks on main engines will be invaluable. The question of altering the component to facilitate rig testing very frequently arises. Sometimes it is obvious that the proposed changes will not affect the results, but it is usually necessary to carry out preliminary checks. Testing of small-scale models should generally be avoided in view of the uncertainty of various mass effects.

The greatest care should be taken in ensuring that the proposed tests will give the required results before the testing programme is started. Very frequently the fact that this is not so comes to light at a much later stage.

The design of the testing machine should be such as to allow no ambiguity about the conditions to which the components are subjected. In endurance testing each test should be carried out under one specific set of conditions. Step testing and other accelerated tests are usually unsatisfactory, although the effect of running under a sequence of different conditions may be adopted when it is clear that the effect of such running gives important results which cannot be obtained from tests under varying conditions.

The testing machine must give reproducible results. All the variables which are inherent in the machine or the testing procedure must first be standardized. If, because of the variability of the test components, reproducible results cannot be obtained, statistical methods must be used and the numbers selected must be such as to allow real statistical analysis.

In a single investigation various designs, materials, &c., may require to be tested. It is essential to carry out consecutive tests in which one variable is changed at a time. Much time can be wasted by testing two or more unknowns at the same time because of the ambiguity of the results.

All components which have been tested should be subjected to a careful inspection such as metallurgical examination. This should be regarded as an integral part of the testing procedure,

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since it is obvious that such investigations may produce important evidence influencing the interpretation of the results as a whole. This is particularly important in statistical testing, for subsequent comparative examination will be most likely to provide the information required for obtaining great uniformity.

The failure of some components is likely to be such that satisfactory examination cannot be carried out because of the change which takes place after failure. In such cases it is necessary to provide some mechanism or procedure for detecting the incidence of failure and stopping the test at this stage.

Compression Creep Testing. By A. H. Sully, M.Sc., Ph.D., F.Inst.P.

To survey the high-temperature creep properties of alloy systems, compression creep tests are made on small dumbbell-shaped specimens, using a machine developed from one in use at the National Physical Laboratory. The specimen has a diameter of 0.125 in. over the gauge-length of 0.25 in., and is loaded on the enlarged ends through alumina push rods. The push rods were proved to resist creep at 1000° C. under the normal test loading. Typical compression creep-test conditions are 3 tons/in.² at 900° C., but some tests have been made at 9 tons/in.² at 815° C., the creep curve being recorded in each case by means of a dial gauge. At 9 tons/in.², 815° C., the compression creep curves are closely similar to those recorded at an equal tension, except that in compression the creep rate does not increase continuously throughout the tertiary stage.

New Studies of the Preparation of the Surface of Aluminium. By Professors G. Chaudron and P. Lacombe

Researches carried out in recent years have emphasized the dependence of the chemical, physico-chemical, and mechanical properties of metal surfaces on the method of polishing employed in their preparation. It is well known that mechanical polishing produces important structural changes in the surface layers of metals, and that these structural changes do not take place in the electrolytic polishing of pure aluminium, for example. There is evidence, on the other hand, of chemical changes at the surface of most electrolytically polished specimens. These chemical changes may be explained by (1) anodic oxidation during electropolishing, and (2) oxidation of the reactive surface after polishing, e.g. during washing or subsequent exposure to the air.

The first part of the work reported in this paper, which was carried out in collaboration with P. Morize, was particularly concerned with this question. Pure aluminium was polished electrolytically in a number of different baths, including the acetic-perchloric acid bath due to Jacquet, who invented electrolytic polishing in 1932. Observations were then made of the characteristics of the polished surfaces, both immediately and after standing in dry, wet, or ordinary air. Solution potential measurement in a 3% solution of NaCl against the calomel electrode proved to give particularly revealing indications of the state of the polished surface. The solution potential as measured after washing the electro-polished pure aluminium specimens in absolute alcohol varied from -1.20 to -0.74 V. On exposure of the specimens to air, the potential progressively approached

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-0.74 V., which is the value of solution potential given by mechanically polished aluminium, the approach being particularly rapid in moist air. It was inferred that the value of -0.74 V. was characteristic of aluminium with an oxide skin, and that the true aluminium surface is much more anodic.

Electro-polishing of aluminium in phosphoric-sulphuric or nitric acid-methyl alcohol baths was found to give a surface covered by a transparent oxide skin, but polishing in the acetic-perchloric acid bath gave a close approach to a true aluminium surface. This was confirmed by immersing the specimens in hydrochloric acid and measuring the rate of release of hydrogen. Aluminium with an oxide skin shows an early passive stage, but this is absent after acetic-perchloric acid polishing.

In the second part of the investigation, carried out in collaboration with G. Yousov, the matter of the true anodic solution potential of aluminium was taken further. Aluminium was electro-polished in a cell from which air was rigorously excluded, and this was followed by washing the specimens with air-free butyl alcohol. In these conditions, the potential against the calomel electrode assumed a value of -1.60 V. It was remarked that this value was practically identical with that recorded when aluminium is immersed in an NaCl solution in the presence of a salt of mercury, which attacks the oxidized surface and removes the oxide skin. This was confirmed for pure aluminium, using the conditions of measurement employed throughout this investigation. -1.6 V. is presumed to approximate closely to the true anodic solution potential of aluminium, since the same figure was obtained by the two dissimilar experimental methods.

The results obtained confirm the value of investigations which have as their aim the production of polished metal surfaces which are as rigorously perfect as possible.

The Examination of Metal Surfaces by Taper-Section Methods. By E. Rabinowicz, B.A.

A metal surface may be examined very effectively if a section is taken inclined at a small angle to the surface—as opposed to the more usual normal section. The surface is first protected by coating it with a suitable electrodeposit; for preference, one that has a similar hardness to the base metal and will adhere strongly. The specimen is mounted in plastic, the taper angle being determined by the shape of the mould. The sectioning is then carried out using a surface grinder, and the specimen is lapped, polished, and etched. Great care is needed at this stage to avoid undue disturbance of the metal interface. The etchant used should be one that does not attack the electrodeposit, and the latter should appear in sharp contrast to the metal. The specimen is then ready for examination under a high-power microscope.

Taper sections are especially useful for studying two-dimensional surface irregularities, i.e. parallel scratches and ridges, which are present on a large variety of metal surfaces. In such cases, the magnification normal to the surface is increased as the cosecant of the taper angle for sections taken across the scratch direction. For example, an angle of 6° corresponds to a magnification of about 10 times. This taper angle is commonly used.

Taper sections have been used for comparing the surface finish produced by various processes, and results are in good agreement

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with results obtained by profilometer methods. An important advantage of taper-sectioning lies in the clear indication given of work-hardening produced below the surface. Other phenomena occurring immediately below the surface have also been studied, for instance the behaviour on deformation of a bearing alloy possessing a duplex structure. Investigations show that when the alloy is deformed by sliding, the hard components are pushed under the surface. These observations support the view that the hard particles play little part in the intrinsic frictional properties of these alloys.

Another use, a very important one, has been the examination of surfaces after sliding. The amount of tearing produced is greatest when the two surfaces consist of the same metal. A good lubricant reduces the extent both of the damage and of the work-hardening. Fragments of one metal adhering to the other are conveniently located, for a taper section is far more likely to intersect them than is a normal section. Interpretation is less straightforward, in this case, however, for the real shape of the fragment cannot be deduced, though its mode of adhesion and penetration can be elucidated.

Surface irregularities, even when not two-dimensional, can be examined with the advantage of the ten-fold magnification ratio as long as they are systematic. Thus, the differential etching between different phases of an alloy shows up clearly.

It thus seems clear that taper-sectioning offers a suitable technique for use in elucidating a wide variety of the problems facing the surface metallurgist.

Note on Incident Polarized Light Microscopy. By A. B. Winterbottom, M.Sc.

Previous workers have obtained interesting results by the microscopic examination of the opaque surfaces using incident polarized light. Extension of this attack to the normal metallographic field is hampered by the fact that polarization effects become weak and non-uniform with objectives of high aperture.

Two ways appear to be open of obtaining useful effects at high aperture: (1) Making use of two successive reflections with intervening rotation of azimuths; and (2) rotation of azimuths by use of a zonal ring plate or a stressed disc.

Trials of both these possibilities—of which the second seems the more promising—are being initiated at Trondheim, where new optical equipment is available. The object is to obtain image contrast between different phases without etching. This should extend the capabilities of the microscope in the study of alloys which are etched with difficulty, and open up also possibilities of working with heated specimens.

Micro-Hardness Testing of Metals. By E. C. W. Perryman, M.A.

A review of some of the information available on the micro-hardness testing of metals was given. A simple micro-hardness tester, which can be fitted to a normal bench microscope, was described. Factors affecting the micro-hardness number were discussed, especially those of specimen surface and crystal orientation. It was shown that large differences between the micro-hardness of the surface and the real hardness can occur if the

surface of the specimen is prepared by mechanical polishing; such surfaces, whether they are etched or not, are harder than those prepared by electro-polishing. Differences as great as 30% are found. Variations in hardness were shown to occur between different grains in annealed super-purity aluminium, lead, and copper. These differences were ascribed to orientation differences between the different crystals.

The use of the micro-hardness tester for the testing of thin metal foils was discussed and results were given for copper foil, 0.0015 in. thick, in various tempers. Other applications were discussed, and examples given.

The Relation of X-Ray and Microscopical Metallography. By A. J. Bradley, D.Sc., F.R.S.

This subject was discussed with special reference to the Fe-Ni-Al system, which has been thoroughly examined by both X-rays and the microscope.

The only sound method for the application of the X-ray technique is that used by Bradley and Taylor, in pursuance of the policy earlier adopted by Swedish investigators. This depends on a two-stage heat-treatment. Firstly, the alloy is heat-treated in lump form at as high a temperature as is practicable. Then, when the alloy is judged to be as homogeneous as possible, filings or drillings are taken for the X-ray powder photographs. These must be further heat-treated to render them free from the stresses introduced by cold working, and for this purpose they are kept at the annealing temperature until X-ray powder photographs give sharp reflections from the $K\alpha$ doublets.

Care must be taken on cooling down to room temperature, to ensure that no transformations occur between the annealing temperature and the temperature at which the photograph is to be taken, for, if so, the photograph will not give a true record of the state of the alloy in equilibrium. For this purpose the alloy is slowly cooled and not quenched. Quenched filings have repeatedly been shown to give erroneous results.

In order to construct an equilibrium diagram the X-ray results are used in conjunction with the microscopical investigation which should follow the X-ray work as quickly as possible. The interpretation of the photomicrographs can only be based on the results of the X-ray investigation. Any other method is highly dangerous, since the microscopist cannot usually interpret a ternary diagram without knowledge of the previous X-ray work, while the X-ray worker cannot do more than adumbrate the nature of the results to be predicted.

The Fe-Ni-Al system provides an example of two kinds of duplex alloy. In the first case, the two phases have crystal structures of different kinds, face-centred cubic and body-centred cubic; the duplex alloy is then of the $(\alpha + \beta)$ type. In the second case, both phases have the same crystal structure and possibly even the same lattice spacing, but they differ in chemical composition; the duplex alloy is then of the $(\alpha + \alpha')$ or the $(\beta + \beta')$ type. Three-phase alloys $(\alpha + \alpha' + \beta')$ or $(\alpha + \beta + \beta')$ are also found in the iron-nickel-aluminium system.

The microscopical method is excellent for the purpose of distinguishing between all of these different states, but very special attention must be given to the times of heat-treatment and the

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degree of magnification. As the temperature of heat-treatment is lowered, longer times are required and the degree of magnification must be proportionally increased. In this research, a time factor of $\times 4$ for every 100°C. fall in temperature has been employed, based on 1 day at 1050°C. At 750°C. , 9 weeks are not too long, and even then a magnification of $\times 4000$ is usually required in order to distinguish the $\alpha + \alpha'$ and $\beta + \beta'$ patterns with certainty.

This should be contrasted with the results of X-ray analysis. With cooling rates of approximately 10°C. per hr., equilibrium is followed down to about 800°C. , as we may readily see by comparing the X-ray and microscopical results. The X-ray technique, however, suffers from the grave disadvantage that it cannot separate two phases with the same type of crystal structure and exactly the same lattice spacing. Strangely enough, this phenomenon is repeatedly found in the X-ray examination of alloy systems. In these circumstances the use of the microscope is indispensable.

Even problems of order and disorder may with considerable advantage be studied by the microscopical method, and the mosaic structures which are such a pronounced feature of the metallic state are readily observed under the highest magnification. The actual dimensions of the mosaic, which appears to be simple cubic, are about a quarter micron or $2.5 \times 10^{-5}\text{ cm.}$, but structural details as small as 1000 \AA have been seen after 9 weeks' heating at 750°C.

Microradiography and Metals. By W. Betteridge, Ph.D., F.Inst.P.

Microradiography is simple in principle and was, in fact, first applied to the study of metals by Heycock and Neville in 1898, although only very low magnifications were achieved. The introduction of extremely fine-grained photographic plates has enabled the method to be developed in recent years so that magnifications of 200 dia. are easily obtained, and by the use of characteristic radiations it is now possible to differentiate, in favourable cases, even between elements which are adjacent in atomic number.

The sample to be examined is mechanically polished to obtain a thin strip usually about 0.002 in. in thickness; a greater thickness than this will usually result in lack of clarity due to superimposition of images, although, if the highest possible magnification is not required because of the coarseness of the structure, a greater thickness may be permissible when the less absorptive elements are concerned. The sample is clamped against the high-resolution photographic plate and the radiograph taken with the radiation selected to give the greatest difference in the linear absorption coefficients of the metals which are to be distinguished. The X-ray tube is operated at a voltage of about 20 kV. , so that the greatest ratio of characteristic radiation to white radiation is obtained. The resultant radiograph, after careful processing and drying to minimize collection of dust on the emulsion, is protected by a cover slip and examined microscopically by transmitted light.

In the study of an alloy with a number of constituents, several microradiographs are required with radiations chosen so that the elements cross the critical absorption edges individually, and it is then possible by a process of elimination to determine to which element certain features of the structure are due.

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The technique is particularly applicable to steels, since the characteristic radiations commonly available are those which are adjacent to the absorption edges of the elements nickel, cobalt, iron, manganese, chromium, vanadium, and titanium. Nevertheless, microradiography is also of value in non-ferrous metallurgy, although identification of constituents is not always easy.

The Electron-Diffraction Method of Determining the Surface Form of Metal Crystals. By D.W. Pashley, B.Sc.

The effects produced on an electron-diffraction pattern from a single crystal surface, by the topography of that surface, were explained and discussed.

When electron diffraction takes place at almost grazing incidence from a surface, then, owing to the limited penetrating power of the electrons, the diffraction pattern arises from the first few atomic layers in the case of perfectly flat surfaces, and from the surface projections in the case of slightly rough surfaces. Very flat surfaces are characterized by the refraction effect produced on the electron beam, while projections of varying shapes and sizes, such as normally arise from etching, produce no special effect. If, however, a surface contains many similar projections with well defined shapes (e.g. pyramids), then additional effects are produced. Examples showing these effects are quoted and discussed.

An account was then given of the application of the electron diffraction method to the study of the surfaces of silver crystals, prepared in various ways.

A Chemical Extraction Method for Use in the Study of Alloy Systems. By D. W. Wakeman, B.Sc., Ph.D.

A well established method for investigations of alloy constitution is the examination, by micrographic or other methods, of alloy ingots which have been slowly cooled from the liquid state. An extension of this is the electrolytic extraction from such ingots of the various primary crystals which have formed. The extracted crystals can be separated by hand into the various species represented and subjected to chemical analysis, or X-ray examination; such investigations greatly assist constitutional work. A further extension of this technique is the extraction of the fine particles of second phase from chill-cast alloys which have been annealed in the solid state, and the use of the extract for X-ray powder photographs.

Notes on Exhibits. By E. E. Kennaird

Micro-Hardness Tester.—The apparatus exhibited is fitted to a Vickers Projection Microscope, an instrument of the inverted type and of robust construction. The indenter, which consists of a diamond pyramid with faces to an angle of 136° , is mounted in the front lens of the objective. Although this arrangement results in the central image-forming rays being occulted, the optical performance of the objective is still sufficiently good to enable grain boundaries, &c., to be recognized, and it is thus possible in conjunction with the cross wires in the eyepiece, to place the impression exactly on the desired area of the specimen. The specimen, which is embedded in a synthetic resin plaster mould, is secured to one end of a carefully balanced lever rocking about

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almost frictionless ball bearings. At the other end of the lever are removable weights and an adjustable weight on a screwed spindle. Accurate balancing of the lever is assisted by the flickering of a red signal light. Immediately above the specimen-holder is situated a platform on which weights from 1 to 500 g. (as usually supplied with a chemical balance) can be placed. When the selected weight has been applied to the platform, the combined objective and indenter are slowly advanced towards the specimen by means of the fine focusing mechanism, until the extinction of the red signal light indicates that contact has been made. On refocusing the specimen the impression is seen in the field of view and the adjustable cross wires and measuring scales can be brought into coincidence with the impression. Scratch tests can also be made by using the stage traverse screws on the microscope after the diamond has made contact with the specimen.

Phase Contrast Equipment, for Incident Illumination.—The phase contrast method was first developed in order to deal with the problem of rendering visible detail in transparent material immersed in a medium of almost identical refractive index, and this is achieved by introducing a difference of phase of $\frac{1}{4}$ wave-length between the direct beam and the light diffracted by the object. In addition, the amplitude of the direct light is reduced. The method involves the use of a phase plate embodying two complementary areas having different optical paths, one of the areas being metallized so that absorption takes place.

It has since been found that considerable benefits are obtained by the use of phase contrast with incident light on opaque specimens. Very striking results are often obtained with minerals and metallic specimens. Crystal boundaries and surface irregularities are brought out with great clarity. When used with the Vickers Projection Microscope, the unit supporting the objective and illuminator tube is attached to the instrument by a bayonet joint and is interchangeable with the Universal Illuminator. The illuminator tube carries an annulus which is used for all powers of objectives. The annulus is readily brought in and out of action and is provided with a centring adjustment. The illuminator tube also contains a condensing lens and is fitted with a variable power adjustment whereby the phase plates in objectives of different powers may be made to coincide with the centring annulus. An auxiliary microscope which is inserted in place of the normal eyepiece enables the annulus to be centred on to the phase plates. Each objective is fitted with an adjustable incident illuminator plate, the necessary phase plate and means of attachment to the microscope which incorporates a device for centring a series of objectives on to a common axis.

LEEDS METALLURGICAL SOCIETY

At a meeting of the Society held on 26 January 1949, in the Chemistry Department of Leeds University, Mr. W. R. Berry, the President of the Society, occupying the Chair, Mr. E. J. Vaughan, M.Sc., gave a lecture on

Non-Destructive Testing.

After discussing the rapidly increasing need for non-destructive testing, the lecturer gave a summary of the methods available—

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extending from simple devices, such as density measurement, to the use of specialized electronic circuits enabling the inspector to follow the passage of ultra-short waves through material or record changes in magnetic susceptibility.

Confining attention to the more modern developments the methods were divided into two groups. The first group comprised those techniques used to detect and locate defects whether surface, sub-surface, or deep-seated. The second group included those methods employed to check composition, heat-treatment, depth of hardening, presence of internal stress, thickness of plating, &c.

Of group one, the Glo-Crack, Magnaflux and high-frequency methods of crack detection were described in detail and examples of their use given. Comparison was made with the American automatic magnetic analysis method, and the possible applications were considered. For the detection of deep-seated defects, the supersonic method was thought to be of first importance and its future possibilities outstanding. The principles and application of the Hughes supersonic instrument were illustrated, and it was pointed out that material up to 12 ft. thick could be examined. Reference was made to the work of some German scientists, and the lecturer expressed the view that the possibilities of the supersonic method would be greatly enhanced when the acoustic lens technique of interpretation could be utilized.

Mr. Vaughan said that methods of the second group were essentially comparator methods, although it was possible under specially controlled conditions to obtain quantitative results. The simple magnetic and electro-magnetic instruments were first described and demonstrated their use in the determination of thickness of plating. A plating must be non-magnetic and plated on a magnetic base. Of greater utility was the Salford magnetic sorter which related the difference in impedance of geometrically similar ferrous metals or alloys with the differences in chemical composition and/or metallurgical condition. The instrument was employed principally in sorting mixed bar stock, but has found use in certain aspects of production control. An account of its application by the Admiralty to inspection problems was given and the importance of investigating its possible use in any contemplated application was stressed, because failures to differentiate between materials of different composition and treatments had been reported in a number of instances.

The final instrument described was the core-loss comparator. The core-loss method of testing depends upon the difference in inductance effect of metals or alloys when forming the core of a high frequency coil which is part of an oscillating circuit. The differences in inductance are related to differences in chemical condition and/or metallurgical condition, and the method is applicable to all types of metals and alloys. It was claimed that the instrument could be used to examine the following properties: chemical composition, hardness, heat-treatment, residual stress, depth of case-hardening, depth of nitrided case, depth of decarburization. Many illustrations of its use in actual inspection of armament stores were given, and it was pointed out that by the use of coils of different frequency the failures noted with the magnetic sorter were eliminated. By the use of special coils it was shown that the instrument could be used for determining plating thickness and in special instances the detection of cracks.

NEWS AND ANNOUNCEMENTS

LONDON LOCAL SECTION

On 9 December 1948, at 4 Grosvenor Gardens, London, S.W.1, a joint meeting was held between the London Local Section of the Institute and the London Branch of the Institute of British Foundrymen. There was a large attendance when, under the Chairmanship of Mr. W. F. Randall, B.Sc., A.R.S.M., the Chairman of the Local Section, Dr. E. Scheuer read a paper on

The Solidification of Metals, with Special Reference to Continuous Casting Processes

In view of the large field covered by the title, the lecture was confined mainly to the metallurgical aspect of the continuous casting process. The essential feature of the continuous casting process is the stationary condition of the solidification zone with regard to position and temperature distribution during the freezing of the whole billet, in contrast to the complicated changes occurring during the solidification of a billet cast in the conventional manner.

The quality requirements of an ideal billet and the features of an ideal billet-casting process designed to meet the requirements were discussed. In the light of this knowledge the conventional casting processes in their simple form were examined. The improvements and refinements applied to them in order to come nearer to the ideal conditions, and after this the more recent developments culminating in the modern continuous casting plants, were described. A short survey of the production aspects and the application of the process to various metals and a note on possible and desirable future developments closed the lecture.

At a meeting held on 6 January 1949, at 4 Grosvenor Gardens, London, S.W.1, Mr. W. F. Randall, B.Sc., A.R.S.M., Chairman of the Section took the Chair. He welcomed the President of the Institute, Sir Arthur Smout, J.P., who was accompanied by the Secretary and who was paying an official visit to the Section. Sir Arthur briefly addressed the members.

Dr. E. Voce, M.Sc., then delivered a lecture on

A Modern Commentary on Copper and its Alloys

The purpose of the lecture was to outline progress in the metallurgy of copper and its alloys during the last decade.

Outstanding advances in connection with copper are the production of the O.F.H.C. grade and the development of continuous casting methods. Important recent researches have dealt with recrystallization and the development of preferred orientation; and also with the effects of additional elements on the conductivity and softening temperature of pure copper. Light has been thrown on the mechanism of the embrittlement of deoxidized copper by bismuth.

Modern copper alloys of high conductivity include those with silver to raise the softening temperature, tellurium to facilitate machining, and cadmium or chromium to improve the strength and fatigue resistance. Heat-treated beryllium-copper is an admirable material for springs and pressure-sensitive instruments.

Experience has demonstrated the advantages of aluminium-brass for marine condenser tubes, and the reduction in the number of

NEWS AND ANNOUNCEMENTS

grades of cast high-tensile brasses from five to three in the newly issued British Standard 1400 is a commendable step.

Methods have been evolved for the elimination of gas unsoundness in bronze and gun-metal castings, and the new British Standard Code of Procedure in Inspection of Copper-Base Alloy Sand-Castings emphasizes that the primary function of the tensile test is to assess melt quality, especially in respect of gas content. In America continuous casting is being applied to bronzes as well as to the straight copper-lead alloys, which are now firmly established as bearing metals. Another useful bearing alloy is chromium-bronze, while heat-treatable bronzes containing nickel have been developed.

During the war increasing quantities of aluminium bronzes were made in the form of hot pressings, forgings, and gravity die-castings, while great interest is being evinced in their use as supercharger blading and heat exchanger tubing for the gas turbine.

Iron-bearing cupro-nickels of relatively low nickel content have been developed for marine condenser tubes, and the cause of sporadic unsoundness in cast nickel silvers has been attributed to the co-existence in the melt of carbon and oxygen.

The ease with which silicon-bronze can be welded is an advantage hardly appreciated when these alloys were originally introduced. Silicon-brasses are favoured in America for gravity die-castings and have been proposed for bell-founding.

Extensive researches have covered both binary and some ternary alloys of copper with electrolytic manganese. Among the most interesting are those of copper with manganese and nickel. After suitable heat-treatment these have mechanical properties comparable with beryllium-copper. It is believed that the effect is due to ordering of the solid solution rather than to precipitation.

A great deal of welcome information has recently been made available on the creep and fatigue of copper and a number of its alloys.

SCOTTISH LOCAL SECTION

The President (Sir Arthur Smout), accompanied by the Secretary, paid an official visit to the Local Section at Glasgow on 14 February 1948, when he received a warm welcome from the Chairman, Mr. A. Craig Macdonald, and a large gathering of members. The meeting was held in a Lecture Room of the Institution of Engineers and Shipbuilders in Scotland.

Mr. R. E. Tricker, M.Sc., F.I.M., read a paper on

Metals in Clock and Instrument Manufacture

after which a discussion took place and the lecturer showed some specimens. The lantern slides exhibited in the course of the lecture were particularly interesting and admired.

The lecturer commenced by mentioning that practically the whole of the improvements in the clock and watch industry for the last century had been in the metallurgy of the materials and the automatic production machinery. The introduction of the steam engine and the internal combustion engine created a large demand for instruments, followed by the expansion of the electrical industry. The required mass production of clocks and

NEWS AND ANNOUNCEMENTS

instruments has only been possible by the development of alloys and steels suitable for high-speed accurate machinery.

As a large range of materials had to be covered, they were dealt with in groups such as turned parts, pressed parts, springs, &c.

Descriptions were given of leaded brass and leaded steel rods which were suitable for Swiss-type automatic machines, particular attention being paid to tolerances, surfaces, and machinability.

Dealing with die-castings, the lecturer discussed three types, viz. zinc-base, aluminium alloy, and tin-base. Slides were shown of typical die-castings, and the importance of controlled analysis to minimize corrosion and growth was emphasized.

Strip materials, both leaded brass and steel, were detailed, with special reference to freedom from stresses for such items as plates and wheels.

In the spring section, mainspring materials—carbon, silico-manganese, and the new Elgiloy—were discussed, and typical analyses and methods of production given. Following this, all the alloys used in hairspring manufacture were illustrated and the reason for the use of each was discussed at length. Among the spring materials were grouped those used for Bourdon tubes, diaphragms, capsules, and bellows, as all these are acting as springs being stressed within their elastic limits.

Magnet alloys were dealt with briefly, and Mr. Tricker showed the great improvements made in the B-H figures in the last few years.

As an example of materials with special applications, the magnetic compensating alloys of the Thermoperm and JAE type were taken and their manner of use explained.

The lecturer closed with a description of the use of sintered bronze bearings in some special motors and clocks.

SOUTH WALES LOCAL SECTION

At a meeting of the Section held at University College, Swansea, on 8 February 1949, Mr. D. W. Hopkins, Chairman of the Section, presided when Mr. G. L. Evans, B.Sc., A.I.M., read a paper on

Metallurgical Industry in the Rhodesias

The address was divided primarily into two portions. Firstly, the scope and scale of metallurgical industry in Northern and Southern Rhodesia were indicated, by reference to statistics of mineral and metal production in the territories, and the importance of mineral resources in the economic structure of both countries was emphasized. Some of the factors which have a bearing on expansion of the metallurgical industries were considered—in particular, transport and port facilities and the availability of native labour were discussed. An attempt was made to point out the desirability of "balanced" development of the territories, with the minimum of interference with, and retardation of, the expansion of metallurgical industries (which form the economic mainstays of the Rhodesias). Reference was made to plans for generating greater quantities of electrical power in the Rhodesias, and the possible consequences of realization of the Kafue or Kariba Gorge hydro-electric schemes were discussed.

The second portion of the address consisted of a brief survey of some of the more interesting technological aspects of the

metallurgical plants of Northern and Southern Rhodesia. Concentration and smelting practices at "Copperbelt" plants were outlined briefly, and an outline of extraction practice at Broken Hill was given. As regards Southern Rhodesia, the problems facing the gold-producing industry were discussed, and mention was made of Government measures aimed at maintaining or increasing gold production. Finally, the chrome ore, asbestos, and coal-mining industries of Southern Rhodesia were surveyed briefly.

OTHER NEWS

SIR BEN LOCKSPEISER'S NEW APPOINTMENT

Sir Edward Appleton, K.B.E., K.C.B., will relinquish on 30 April 1949, his appointment as Secretary to the Committee of the Privy Council for Scientific and Industrial Research.

The King has been graciously pleased to approve the appointment of Sir Ben Lockspeiser, M.A., M.I.Mech.E., to succeed Sir Edward Appleton.

Sir Ben Lockspeiser is at present Chief Scientist at the Ministry of Supply and will take up his new appointment on 1 May 1949.

METALLURGICAL APPLICATIONS OF OPTICAL TECHNIQUES

To encourage the application in metallurgical industry and research of known optical techniques, the British Iron and Steel Research Association will hold a conference on 9 and 10 May 1949, at Ashorne Hill, Leamington Spa. The general Chairman will be Mr. E. W. Colbeck.

The practical application of three techniques will be the subjects of the discussions, together with essential theoretical treatments, to describe each technique as a laboratory art. There will also be practical demonstrations throughout the conference. The three techniques are: (a) phase contrast microscopy; (b) the multiple beam interference technique; and (c) the reflecting microscope. Of these, apparatus for the first two are commercially available, and the third is being developed with the aid of a Nuffield grant.

The phase contrast microscope, which has been largely developed by Dr. Burch, at Bristol University, is already used to quite a large extent in Universities, particularly in biological work in which "transmission" technique can be employed with light shining through the specimens. In metallurgical work reflection technique must be used, and by its means greatly increased contrast may be obtained to accentuate very small differences. It is thought that this could make a most useful tool, both for routine testing and in the pursuit of research.

The multiple beam interference technique has been developed by Professor Tolansky at Manchester University and the Royal Holloway College. This is essentially a research tool for studying surface topography and gives phenomenal magnification in depth, so that height changes of the order of 20 to 40 Ångström units may be estimated.

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Both the above are available commercially.

The Burch reflecting microscope has also been developed at Bristol University, now with the aid of a Nuffield grant by means of which ten instruments are being manufactured. It gives the advantage of a large working distance, and can therefore be used for examining specimens maintained under particular conditions, for example at high temperatures. It has the further advantage that the instrument can be focused with visible light before using ultra-violet or infra-red ray.

In this connection Dr. Bouwers is coming over from Holland to explain and discuss his modifications, which are available commercially.

Application to attend and for accommodation at Ashorne Hill should be made to the Metallurgy Division, B.I.S.R.A., 11 Park Lane, London, W.1.

POROSITY OF ELECTROPLATED NICKEL FOIL

The Research Committee of the American Electroplaters' Society, at its quarterly meeting held in Rockford, Ill., on 10 December 1948, reported that, as a result of researches, it had been found that the porosity of electroplated nickel foil varies with the crystal structure of the deposit. Since it has been generally conceded that wrought foils are less porous than similar electrodeposited foils from commercial baths, this discovery may well prove to be the corner-stone for improving the corrosion-resistance of nickel electrodeposits. Future researches on this subject will determine if nickel baths operating under commercial conditions can be modified to give a crystal structure with an improved corrosion-resistance. Dr. N. Thon of Princeton University is conducting work on this project entitled "Nature and Effect of Porosity in Electrodeposits". The Research Committee is currently conducting researches on eight other fundamental problems in electroplating in a number of leading Universities and at the Bureau of Standards.

B.O.C. PRIZE FOR WELDING RESEARCH

No award has been made for 1948-49 of the British Oxygen Company's £100 prize, but it is hoped that some welding research will be deemed worthy of the prize during the present year. Particulars of the conditions governing the prize may be obtained from the British Welding Research Association, 29 Park Crescent, London, W.1.

JAPANESE SCIENTIFIC RESEARCH INSTITUTES

The former Institute of Physical and Chemical Research, Tokyo, was dissolved and its work has been taken over by the Scientific Research Institute, Ltd., which was established on 1 March 1948, and the address of which is Komagome, Bunkyo-ku, Tokyo, Japan.

The Bulletin of the old Institute (*Rikagaku Kenkyu-jo Iho*) has been superseded by the *Kagaku Kenkyujo Hokoku* (Reports of the Scientific Research Institute), which is published in Japanese. Publication, for the time being, will be irregular.

DIARY FOR APRIL

LOCAL SECTION MEETINGS

THURSDAY, 7 APRIL

Birmingham Local Section.—Annual General Meeting. (James Watt Memorial Institute, Great Charles St., Birmingham, at 6.30 p.m.)

London Local Section.—Annual General Meeting, followed by an Open Discussion on "Controlled Atmospheres". (4 Grosvenor Gardens, London, S.W.1. A.G.M. at 6 p.m.; Discussion at 7 p.m.)

FRIDAY, 22 APRIL

Birmingham Local Section.—Dr. W. H. J. Vernon: "Corrosion". Joint meeting with the Local Section of the Royal Institute of Chemistry. (James Watt Memorial Institute, Great Charles St., Birmingham, at 6.30 p.m.)

TUESDAY, 26 APRIL

South Wales Local Section.—H. R. Brooker: "Brazing". (University College, Singleton Park, Swansea, at 6.30 p.m.)

OTHER MEETINGS

FRIDAY, 1 APRIL

Institution of Mechanical Engineers, Applied Mechanics Group.—Dr. F. P. Bowden: "Seizure of Rubbing Surfaces"; and Dr. J. R. Bristow: "The Measurement of Kinetic Boundary Friction or the Experimental Investigation of 'Oiliness'". (Storey's Gate, London, S.W.1, at 6 p.m.)

Royal Institution.—Dr. S. Tolansky: "The Examination of Crystal and Metal Surfaces, Using Interferometry". (Friday Evening Discourse.) (21 Albemarle St., London, W.1, at 9 p.m.)

TUESDAY, 5 APRIL

Electrodepositors' Technical Society, Midlands Centre.—A. N. Brand: "Ventilation and Exhaustion Systems". (James Watt Memorial Institute, Great Charles St., Birmingham, 3, at 6.30 p.m.)

WEDNESDAY, 6 APRIL

Institution of Electrical Engineers, North Staffordshire Sub-Centre.—Dr. L. E. Ryall: "Scientific Work of the Post Office". (Duncan Hall, Stone, at 7 p.m.)

THURSDAY, 7 APRIL

Institute of Physics, Midland Branch.—Dr. C. Sykes: "Physics in Steel Manufacture". (Imperial Hotel, Birmingham, at 6.30 p.m.)

NEWS AND ANNOUNCEMENTS

Institute of Welding, South London Branch.—Annual General Meeting, and speaker on developments in the U.S.A. (Institute of Marine Engineers, 85-88 The Minories, London, E.C.3, at 6.30 p.m.)

Leeds Metallurgical Society.—Film on Rocket Flight Development. (Chemistry Dept., The University, Leeds 2, at 7 p.m.)

Liverpool Metallurgical Society.—Annual General Meeting. Films will be shown on (1) "Steelmaking", and (2) "A Story of Copper". (Liverpool Engineering Society, 9 The Temple, 24 Dale St., Liverpool, at 7 p.m.)

FRIDAY, 8 APRIL

Electrodepositors' Technical Society.—Annual Conference : First Day. (Palace Hotel, Buxton, 3 p.m.)

West of Scotland Iron and Steel Institute.—Annual General Meeting. (39 Elmbank Crescent, Glasgow, C.2.)

SATURDAY, 9 APRIL

Electrodepositors' Technical Society.—Annual Conference : Second Day. (Palace Hotel, Buxton, 10 a.m.)

TUESDAY, 12 APRIL

Chemical Engineering Group (Society of Chemical Industry).—H. W. Thorp: "Chemical Engineering Problems in the Sea-Water Magnesia Process". (Geological Society, Burlington House, London, W.1, at 5.30 p.m.)

Faraday Society.—General Discussion on Crystal Growth : First Day. (Department of Physics, University of Bristol, 2.30-6 p.m.)

Institution of Electrical Engineers, Radio Section.—Dr. R. H. Barfield: "Radio-Frequency Heating". (The Institution, Savoy Place, London, W.C.2, at 5.30 p.m.)

Institution of Mechanical Engineers, Automobile Division.—R. J. Love and Dr. H. R. Mills: "The Fatigue Strength of Cast Crankshafts". (Storey's Gate, London, S.W.1, at 6 p.m.)

WEDNESDAY, 13 APRIL

Faraday Society.—General Discussion on Crystal Growth : Second Day. (Physics Department, University of Bristol, 9.30 a.m. to 1 p.m. ; 2.30 to 6 p.m.)

Institute of Welding, West of Scotland Branch.—D. M. Kerr: "Fundamentals in Arc Welding Production Costs". Annual General Meeting. (39 Elmbank Crescent, Glasgow, C.2, at 7 p.m.)

Institute of Welding, North London Branch.—Annual General Meeting. (Polytechnic, Regent St., London, W.1, at 7.30 p.m.)

THURSDAY, 14 APRIL

Faraday Society.—General Discussion on Crystal Growth : Third and Last Day. (Physics Department, Bristol University, 9.30 a.m. to 1 p.m.)

NEWS AND ANNOUNCEMENTS

FRIDAY, 15 APRIL

West of Scotland Iron and Steel Institute.—Annual General Meeting. (39 Elmbank Crescent, Glasgow, C.2, at 6.45 p.m.)

THURSDAY, 21 APRIL

Institution of Mining and Metallurgy.—H. R. Potts and E. G. Lawford: "Recovery of Sulphur from Smelter Gases by the Orkla Process at Rio Tinto". (Geological Society, Burlington House, London, W.1, at 5 p.m.)

FRIDAY, 22 APRIL

Institution of Chemical Engineering.—27th Annual Corporate Meeting. (Geological Society, Burlington House, London, W.1, at 5.30 p.m.)

Institution of Mechanical Engineers.—E. G. Bailey: "Invention and the Sifting Out of Engineering Facts". (James Clayton Lecture. (Storey's Gate, London, S.W.1, at 6 p.m.)

WEDNESDAY, 27 APRIL

Geological Society of London.—Anniversary Meeting. (Burlington House, Piccadilly, London, W.1.)

WEDNESDAY AND THURSDAY, 27 AND 28 APRIL

Iron and Steel Institute.—Annual General Meeting. (27 April at Central Hall, Westminster, London, S.W.1, at 9.45 a.m.; 28 April at Institution of Mechanical Engineers, Storey's Gate, London, S.W.1, at 9.45 a.m.; Luncheon, Dorchester Hotel at 12.45 p.m.)

APPOINTMENTS VACANT

To conform to the requirements of the Control of Engagements Order, 1947, these advertisements are published for the information only of those who are "excepted persons" under the Order.

EXPERIENCED ASSAY AND ANALYTICAL CHEMIST required for factory in S.E. London, engaged on non-ferrous metals. Reply, stating age, experience, and salary required to Box No. 259, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

METALLURGICAL CHEMIST wanted for smelting works in Singapore. B.Sc. or equivalent qualification. Salary according to age and experience. Write Box I.N.W., c/o 95 Bishopsgate, London, E.C.2.

METALLURGICAL ENGINEERS, with knowledge of German, are invited to apply for technical development post in Switzerland. Write Manager, Development and Research Department, Mond Nickel Company, Ltd., Grosvenor House, Park Lane, London, W.1. Mark envelope "S Confidential".

METALLURGIST required as assistant to Plant Manager in department making metal products at works in Thames Side (Essex) area. Some experience in powder metallurgy an advantage. Age between 25 and 30 years. Salary £450-£650, according to qualifications. Reply, giving details of qualifications and experience, present salary, &c., to Box No. 261, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

METALLURGIST required for laboratories of large engineering firm in West London. Duties would include complete metallurgical control of modern light alloy foundry. Salary £600-£800 p.a., and superannuation. Applications with full details of age, training, and experience to Box No. 258, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

NEWS AND ANNOUNCEMENTS

NON-FERROUS FOUNDRY TECHNICIAN required, enterprising modern small foundry Central Scotland. Excellent prospects for keen young man. Good salary with bonus on results. Address 2624, Wm. Porteous & Co., Glasgow.

PRODUCTION METALLURGIST required for plant producing powder metallurgical products, situated in Thames Side (Essex) area. Some experience in powder metallurgical practice essential. Good prospects for candidate with suitable metallurgical qualifications and experience. Age between 35 and 40 years. Commencing salary £300-£1000, according to qualifications. Box No. 260, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

TWO VACANCIES FOR GRADUATES have arisen on the staff of the Research Laboratories of the General Electric Co., Ltd., North Wembley, Middlesex. (a) **WELDING METALLURGIST**, preferably with experience, for work on the metallurgical aspects of welding. (b) **ASSISTANT METALLURGIST**, aged about 25, with 2-3 years' experience in a works metallurgical department, for work in a metallurgical laboratory in the South-East London area. Applications for both vacancies should be addressed to the Personnel Officer at Wembley, giving age, qualifications, and experience.

UNIVERSITY OF BIRMINGHAM, DEPARTMENT OF INDUSTRIAL METALLURGY. Applications are invited for the post of **LECTURER (Grade IIB)** in Industrial Metallurgy. Candidates should possess a suitable University degree and have acquired industrial experience either in foundry metallurgy or in the wrought fabrication of metals. Commencing salary £600-£700 per annum according to qualifications. Further particulars may be obtained from the undersigned to whom applications should be sent not later than 9 April. C. G. BURTON, Secretary, The University, Birmingham 3.

VACANCY advertised under Box No. 253 has now been filled.

APPOINTMENT REQUIRED

ELECTRICAL ENGINEER requires responsible executive or technical sales position. 14 years' practical experience physical metallurgy and application all classes metals to light engineering. Some business experience. Box No. 262, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

"The Structure of Cast Iron"

by **ALFRED BOYLES** of United States
Pipe and Foundry Co., Burlington, New Jersey

A series of lectures with particular emphasis on the theoretical side of cast iron metallurgy. A great deal remains to be learned about this plebeian among metals, for the common grey iron is an alloy of great complexity and one which has been somewhat neglected by physical metallurgists in favour of the more aristocratic members of the alloy domain.

The lectures are limited to the structure of cast iron as determined by the mechanism of freezing and transformation, and the argument is frankly addressed to metallurgists familiar with the steels, but unfamiliar with cast iron. Cast iron is dealt with as a ternary alloy of iron, carbon and silicon, the structure of which is modified by the minor elements, manganese, sulphur and phosphorus. Special alloying elements, added to produce specific properties, do not come within the scope of the lectures. Attention is centred for the most part on alloys of hypoeutectic composition, because most of the grey iron has been drawn upon freely and many references are cited.

The 124 pages of this book are well illustrated with figures and tables relating to the discussion, and the six chapters are subdivided into smaller groupings to explain thoroughly step by step in detail the various phases of cast-iron metallurgy.

154 Pages.

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INSTITUTE NEWS AND ANNOUNCEMENTS

AUTUMN MEETING, PARIS, 3-10 OCTOBER 1949

The 1949 Autumn Meeting in Paris will commence on Monday, 3 October (*not* 26 September, as provisionally arranged) and will continue until Monday, 10 October. The meeting will be held at the same time as the Annual Meeting of the Société Française de Métallurgie, and care will be taken that the French Society's discussions on non-ferrous metallurgy do not clash with the discussions of the Institute of Metals.

Members will be expected to arrive in Paris on either Saturday, 1 October or Sunday, 2 October to be present to register on Monday, 3 October, when visits to works and laboratories will probably take place. In the evening of that day Professor Georges Chaudron (Sorbonne) will deliver the 1949 Autumn Lecture to the Institute of Metals, after which there is expected to be a *conversazione*.

Papers will be presented and discussed on the mornings of Tuesday and Wednesday, 4 and 5 October, and in the afternoons there will be visits to works, laboratories, or places of interest in Paris or the vicinity.

Social functions are being arranged for the evenings, and during the course of the meeting members and ladies will be guests at a banquet and dance of the Société Française de Métallurgie.

During the meeting, members of the Institute of Metals will join with French metallurgists at the celebrations of the centenary of the birth of Floris Osmond; the President of the Republic is expected to be present.

On Thursday, 6 October or Friday, 7 October, tours to places of interest will commence, including one to the Chateaux of the Loire, combined with visits to works, &c., of metallurgical interest.

Dr. Richard Seligman has accepted an invitation to deliver a lecture, in French, to the Société Française de Métallurgie during the course of the meeting.

An influential Reception Committee and a Ladies Reception Committee have been formed, and a most attractive programme is being devised, full details of which will be sent to members at an early date.

Members are particularly requested to note the revised dates

NEWS AND ANNOUNCEMENTS

of the meeting, at which it is hoped that there will be a large attendance. Hotel and travel, &c., arrangements will be made by an Agency for those who desire to take advantage of these facilities.

MAY LECTURE, 25 MAY, BY SIR EDWARD APPLETON

Members are reminded that the 1949 May Lecture will be delivered by Sir Edward Appleton, G.B.E., K.C.B., M.A., D.Sc., F.R.S., on Wednesday, 25 May 1949, in the Hall of the Royal Geographical Society, Kensington Gore, London, S.W.7 (near the Albert Hall).

It is hoped that there will be a large attendance on this occasion.

ANNOTATED EQUILIBRIUM DIAGRAM NO. 7: SYSTEM BERYLLIUM-COPPER

Annotated Equilibrium Diagram No. 7: "The Equilibrium Diagram of the System Beryllium-Copper", by Dr. G. V. Raynor (4to, 6 pp., with 2 illustrations) has now been published. Copies may be obtained from the Secretary, price 2s., post free. Every member is entitled to one copy of this publication at the reduced rate of 1s., post free.

CAPPER PASS AWARDS

The Capper Pass Awards Adjudicating Committee has made three awards, of £50 each, to the authors of the following papers published in the *Bulletin of the Institution of Mining and Metallurgy* or the *Journal of the Institute of Metals* in 1948. The awards are made annually from a fund provided by Messrs. Capper Pass and Son, Ltd., of Bristol, to encourage the writing of papers on non-ferrous extraction metallurgy and on processes or plant used in the extraction or fabrication of non-ferrous metals. Fuller details of the awards are given in the news section of the *Journal of the Institute of Metals*, 1949, (Jan.), p. 57.

(1) C. BLAZEY, L. BROAD, W. S. GUMMER, and D. P. THOMPSON, "The Flow of Metal in Tube Extrusion" (*J. Inst. Metals*, 1948, Dec.).

(2) H. R. POTTS, "Further Notes on Converter Practice at Rio Tinto" (*Bull. Inst. Min. Met.*, 1948, March).

(3) R. C. TRUMBULL, W. HARDIEK, and E. G. LAWFORD, "Notes on the Treatment of Pyrites Cinders at the Plant of the Pyrites Co., Inc., Wilmington, Delaware" (*Bull. Inst. Min. Met.*, 1948, Dec.).

PERSONALITIES: NEW VICE-PRESIDENTS AND MEMBERS OF COUNCIL

Major C. J. P. Ball, D.S.O., M.C., F.R.Ae.S., and Dr. C. J. Smithells, M.C., F.I.M., have been elected Vice-Presidents of the Institute, and Mr. E. A. Bolton, M.Sc., F.I.M., Mr. C. H. Davy, M.I.Mech.E., and Dr. A. G. Quarrell, A.R.C.S., D.I.C., F.Inst.P., F.I.M., have been elected Ordinary Members of Council. Some biographical details of each of them are published below.

MAJOR C. J. P. BALL, D.S.O., M.C., F.R.Ae.S.

Major Charles James Prior Ball, son of Mr. G. W. Ball, J.P., of Cowes, Isle of Wight, was born on 15 February 1893, and was educated at Charterhouse and London University. During the First World War he was commissioned in the Royal Artillery in 1914; took part in the landing at Cape Helles, Gallipoli, on 25 April 1915, with the 29th Division, and served throughout in these operations and afterwards in Sinai, France, and Belgium. He was three times mentioned in despatches and awarded the Military Cross and the Distinguished Service Order. After the war, he served with the British Army of Occupation at Cologne. Later, he was appointed to the Armaments Sub-Commission of the Military Inter-Allied Commission of Control, and for the next four years—first as Vice-President and then as President of the Rhineland district—organized the supervision and destruction of more than 5000 armament factories and stocks of armament in the West.

In 1923 Major Ball retired from the Army and joined the firm of F. A. Hughes and Company, Ltd., which was then a small concern trading mainly with the Continent in special chemical products. In course of time a large business was built up in heavy chemicals, plastics, and explosives, and special processes and equipment were brought over from the Continent so that the firm could manufacture its own plastic products.

The firm of F. A. Hughes and Company, Ltd., had also pioneered the use of important magnesium alloys developed by the Germans. After negotiations with the German owners of the patent manufacturing processes, Major Ball took the initiative in forming Magnesium Elektron, Ltd., and—as its Chairman and Managing Director—was responsible for the erection of a factory at Clifton Junction, near Manchester, which went into production in 1936. With the war-time demand for magnesium rapidly increasing, the plant at Clifton Junction was doubled in size in 1940, and when it became clear that still greater production would be needed, in 1942 the firm, on behalf of H.M. Government, erected an additional plant near Burnley.

In 1941 Major Ball, with two of his staff, flew to the United States to advise the U.S. Government on the production of magnesium, and, under the direction of Major Ball and his technical staff, the largest magnesium plant in the world, near Boulder Dam in Nevada, was erected; within 10 months of breaking ground the first metal was produced, and when the plant was in full production it gave 10% more than planned figures. During the period



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May 1941 to September 1944 Major Ball flew the Atlantic ten times, mainly in bombers.

Despite his many business activities in connection with war-time production, Major Ball also served in the Home Guard, and he commanded "F" Company, 42nd Bn. (Home Guard) Lancashire Fusiliers.

After the acquisition of F. A. Hughes and Company, Ltd., by The Distillers Company, Ltd., Major Ball was elected to the Board of the latter Company in September 1946, and to the Management Committee in October 1948.

In 1920, Major Ball married Eva, daughter of Herbert Lucas, of Shepleigh Court, Devon, and has two sons and one daughter. Assisted by Mrs. Ball, he farms his own estate in Hampshire, specializing in pedigree shorthorns and Suffolk sheep. He is a keen shot and a skilled yachtsman.

Major Ball was elected a Member of the Institute in 1937 and a Member of Council in 1945. He became the Chairman of the Finance and General Purposes Committee in 1948. He is a Fellow of the Royal Aeronautical Society; a Past-Master of the Worshipful Company of Glass Sellers, of the City of London; and a Member of the Worshipful Company of Coach Makers and Coach Harness Makers of London.

DR. C. J. SMITHELLS, M.C., F.I.M.

Dr. Colin James Smithells was born in 1892, educated at Bedales and Leeds University, and in 1914 graduated B.Sc. in Chemistry with First Class Honours. He was an 1851 Exhibitioner, and was awarded the degree of D.Sc. of Leeds University in 1921.

From 1914 to 1918 he served in the 9th Bn. The Gloucester Regiment and became Second-in-Command, with the rank of Major. He was awarded the Military Cross and was mentioned in despatches.

After the war, in 1919, he joined the Research Staff of the General Electric Company, Ltd., of which he was an original member, and remained there until, in 1938, he took up the post of General Manager to Lodge Plugs, Ltd., Rugby, which post he held until 1944, when he was appointed Director of Research of The British Aluminium Company, Ltd., and established the Research Laboratories at Chalfont Park in Buckinghamshire.



Dr. Smithells' main fields of research have been in connection with tungsten in relation to electric lamps; the physics of lamp manufacture; the development of receiving valves; heat-resisting alloys; gas-metal equilibria; and powder metallurgy, leading to the development of the G.E.C. heavy (tungsten-nickel-copper) alloy. He is the

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author of seven papers published in the *Journal of the Institute of Metals*, and of papers in the *Proceedings of the Royal Society*, &c. ; and also of books on "Tungsten", "Impurities in Metals", and "Gases in Metals". He was Cantor Lecturer to the Royal Society of Arts in 1938.

Dr. Smithells was elected a member of the Institute of Metals in 1922 and has served on the Council as a Chairman of the London Local Section from 1934 to 1936, and later as an Ordinary Member of Council from 1936 to 1940, and 1945 to 1949, and is a Past-Chairman of the Publication Committee and the Meetings Committee. He is a member of the Iron and Steel Institute, American Institute of Mining and Metallurgical Engineers, and other scientific and technical societies ; Honorary Treasurer and a Founder Fellow of the Institution of Metallurgists ; a Member of Council of the British Non-Ferrous Metals Research Association, and a member of its Research Board and various committees ; Chairman of the Pure Metals Committee of the Department of Scientific and Industrial Research ; Chairman of the Research Committee of the Aluminium Development Association ; and Acting Chairman of the Inter-Services Metallurgical Research Council.

In 1918, Dr. Smithells married Mary, daughter of Professor J. B. Cohen, F.R.S., and has two sons and three daughters. His hobbies are golf, bee-keeping, painting, and making furniture.

MR. E. A. BOLTON, M.Sc.

Mr. Eric Arnold Bolton, who has been elected an Ordinary Member of Council, served on the Council previously, as Chairman of the Birmingham Local Section, from 1946 to 1948. Born in 1899 and educated at the George Dixon Grammar School, Birmingham, and at Birmingham University, Mr. Bolton served in the Royal Air Force in 1918-1919. While holding the position of Works Chemist to the Non-Ferrous Casting Company, of Birmingham, he won the Hingeley Scholarship in 1919, entered the University, and obtained the degree of M.Sc. in Metallurgy in 1922. He held a Research Fellowship with the British Non-Ferrous Metals Research Association in 1922-1923, and entered the Research Department of The British Aluminium Company, Ltd., at Warrington in 1923.

Joining the staff of Kynoch, Ltd., Birmingham (later Imperial Chemical Industries, Ltd.) in 1925, as Assistant Departmental Manager, he transferred to the Company's Selly Oak Works (now known as the Elliott Works) in 1935 as Deputy Factory Manager, and became Factory Manager at the commencement of 1946.

Mr. Bolton, who joined the





Birmingham Metallurgical Society in 1917, was a Member of Council of that Society for a number of years and was President in 1936-1937. He was elected a Member of the Institute in 1921, and was elected a Fellow of the Institution of Metallurgists in 1946. He has published two papers in the *Journal of the Institute of Metals*, viz. "The Cause of Red Stains on Sheet Brass" (1923, vol. XXX), and "The Removal of Red Stains from Brass" (1925, vol. XXXIII).

MR. C. HUMPHREY DAVY,
M.I.Mech.E.

Mr. Christopher Humphrey Davy was born in 1903 and educated at Alleyn's School,

Dulwich, and at Herne Bay College, Kent.

In 1920 he entered the firm of Babcock and Wilcox, Ltd., as a student apprentice at their works in Scotland and, after a period of three years in the workshops, gained experience in the erection of steam generating plant in the field. He was appointed Chief Research Engineer to the Company in 1931, in which position he was actively engaged in the development of non-ferrous furnishings for pipe-line valves and steam boiler mountings to withstand high pressure and temperature. He was appointed to the Board of Directors of Babcock and Wilcox, Ltd., in 1947.

Mr. Davy was elected a member of the Institute of Metals in 1931. He is a member of the Institution of Mechanical Engineers, the Iron and Steel Institute, the Institute of Fuel, and the Institute of Welding. For a number of years he was a member of the Welding Research Council of the Institute of Welding, the work of which Council was ultimately taken over by the British Welding Research Association, on its formation. Mr. Davy has also taken an active part in the work of the British Standards Institution in the preparation of engineering standards, and is a member of the J/E Committee—Steels for High Temperature, of the British Electrical and Allied Industries Research Association.

DR. A. G. QUARRELL, A.R.C.S., D.I.C., F.Inst.P., F.I.M.

Dr. Arthur George Quarrell was born at Swindon, Wiltshire, on 30 October 1910, and was educated at the College Secondary School, Swindon, and the Imperial College of Science and Technology, London, graduating with Second Class Honours in Physics in 1932.

From 1931 to 1936 he worked in the Department of Chemical Technology of the Imperial College, first as a post-graduate student and then as Research Assistant to Professor G. I. Finch, working on the development and application of electron diffraction.

In 1936 Dr. Quarrell was Research Assistant to Professor J. H. Andrew in the Metallurgy Department of Sheffield Univer-

sity; from 1937 to 1940 he was Assistant Lecturer in Metallurgy, and from 1940 to 1945 was Lecturer in Metallurgy at Sheffield University. At Sheffield he carried out researches on the electron diffraction of oxide films on iron and steel at elevated temperatures; hair-line crack formation in alloy steels and the embrittlement of steel by hydrogen; slag-metal reactions; and the removal of phosphorus from steel. He was awarded the degree of D.Sc. of London University in 1944.

He was appointed Senior Metallurgist to the British Non-Ferrous Metals Research Association in October 1945, a post that he held until, in April 1946, he became Research Manager to the Association. In that position he is responsible for the Research Department, which has doubled in size during the past three or four years.

Dr. Quarrell was elected a member of the Institute of Metals in 1946. He is a Member of Council of the Physical Society; a Fellow of the Institution of Metallurgists and a member of the Examinations Board of that Institution.



ELECTION OF ORDINARY MEMBERS, ASSOCIATE MEMBERS, AND STUDENT MEMBERS

The following 22 Ordinary Members, 1 Associate Member, and 14 Student Members were elected on 21 March 1949:

As Ordinary Members

- ARKINSTALL, Leonard C., 21 Westfield Hall, Hagley Road, Edgbaston, Birmingham.
- ARMSTRONG, William James, A.I.M., Assistant Laboratory Manager, Enfield Rolling Mills, Ltd., Brimsdown, Enfield, Middlesex.
- BERRY, Brian Exley, M.A., Production Manager, Powder Metallurgy Division, Murex, Ltd., Rainham, Essex.
- BEST, Victor Harold, Managing Director, Calorizing Corporation of Great Britain, Ltd., Babcock House, Farringdon Street, London, E.C.4.
- BULLARD, Charles Frederick, Metallurgical Engineer, Rendel, Palmer and Tritton, Consulting Engineers, 55 Broadway, London, S.W.1.
- COUPLAND, Ernest, M.Sc., Chief Engineer, Rubery Owen and Co., Ltd., Darlaston.
- CROXFORD-ADAMS, George Francis, Consulting Engineer, "Chestnut House", Barrowby, near Grantham, Lincolnshire.

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- FERRELL, Edward Francis, B.S., M.S., Ph.D., Research Engineer, Battelle Memorial Institute, 505 King Avenue, Columbus, O., U.S.A.
- GEORGE, A. G., Engineer, Indian Government Mint, 47 Strand Road, Calcutta, India.
- GOW, James T., M.S., Chief Metallurgist, Electric Steel Foundry Company, 2141 North West 25th Avenue, Portland 10, Ore., U.S.A.
- KEE, William Wardrop, B.Sc., Chief Metallurgist, Enfield Rolling Mills, Ltd., Brimsdown, Enfield, Middlesex.
- LACHAUD, Charles, Ingenieur aux Services Techniques, Compagnie Générale du Duralumin et du Cuivre, 23-25 Avenue Franklin D. Roosevelt, Paris 8e, France.
- LANE, Arthur, Rolling Mill Manager, Enfield Rolling Mills, Ltd., Brimsdown, Enfield, Middlesex.
- LEBOUTEUX, Henri Louis, Chef de la Documentation Centre Technique de l'Aluminium, 87 Boulevard de Grenelle, Paris 15, France.
- MARDELL, Edmund C. H., Chemist, John Walton and Company, Southbury Smelting Works, Enfield, Middlesex.
- METZGER, Otto, Dipl.-Ing., F.I.M., Director, Enfield Rolling Mills (Aluminium), Ltd., Brimsdown, Enfield, Middlesex.
- NABARRO, Frank Reginald Nunes, M.B.E., M.A., B.Sc., Royal Society Warren Research Fellow, H. H. Wills Physical Laboratory, Royal Fort, Bristol 8.
- SLATER, Walter French, B.Sc., Director and General Manager, Thomas Bolton and Sons, Ltd., Froghall, North Staffordshire.
- SPENCE, Neville Spence, B.Sc., Director of Research and Development, Dominion Magnesium, Ltd., Haley, Ont., Canada.
- STRÖM, Bengt Ingemar Vilhelm, Research Engineer, AB Svenska Metallverken, Västerås, Sweden.
- SYKES, John, F.I.M., Metallurgist, Enfield Rolling Mills, Ltd., Brimsdown, Enfield, Middlesex.
- ZENER, Professor Clarence M., Ph.D., Professor, Institute for the Study of Metals, University of Chicago, Chicago, Ill., U.S.A.

As Associate Member

- CHILDS, Wylie J., Ph.D., Staff Member, Massachusetts Institute of Technology, Cambridge 39, Mass., U.S.A.

As Student Members

- ADAMS, Gordon Joseph, Student of Metallurgy, Birmingham University.
- AERON-THOMAS, Paul, Student of Metallurgy, University College, Swansea, Glamorganshire.
- ASHTON, Geoffrey, Junior Technical Assistant, British Thomson-Houston Company, Ltd., Rugby.
- BURGAN, Dean D., Metallurgical Technician, Battelle Memorial Institute, 505 King Avenue, Columbus, O., U.S.A.
- DODRIDGE, Norman Roy, Assistant Experimental Officer, D.S.I.R., Garston, Hertfordshire.
- HARRIS, John Noel, Student of Metallurgy, University College, Swansea, Glamorganshire.
- JASTRZEBSKI, Klemens Roman, Student of Metallurgy, University College, Swansea, Glamorganshire.

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- JOHNSON, Charles Anthony, Laboratory Assistant, Baker Platinum, Ltd., Slough, Buckinghamshire.
- LEE, John Reginald, Student of Metallurgy, University of Birmingham.
- MANNIX, Donald John, B.A., Student of Metallurgy, Cambridge University.
- ORCHARD, Gordon Stanley, Student of Metallurgy, Cambridge University.
- SMITH, Kenneth Alfred, Metallurgical Laboratory Assistant, William Mills, Ltd., Wednesbury, Staffordshire.
- WATERHOUSE, Robert Barry, B.A., Student of Metallurgy, Cambridge University.
- WILSON, Terence Harold, B.Sc., Foundry Metallurgist, Ford Motor Company, Ltd., Dagenham, Essex.

PERSONAL NOTES

MR. H. E. ARBLASTER has left Stokes and Sons Pty., Ltd., to become General Manager of New Metals (Australia), Ltd., who will be concerned with the extraction of beryllium, caesium, columbium, and tantalum from their ores.

DR. R. W. BAILEY, Head of the Mechanical and Metallurgical Department of the Metropolitan-Vickers Electrical Company, Ltd., Trafford Park, Manchester, has been elected a Fellow of the Royal Society.

MR. H. G. BARON has left Leyland Motors, Ltd., to become a student at Manchester University.

PROFESSOR P. BASTIEN has been nominated as a Chevalier de la Légion d'Honneur.

MR. JOSEF BERGMANN has been elected an Associate of the Institution of Metallurgists.

MR. B. J. BISHOP has been appointed Commercial Manager of The Barber Switchgear Company, Holliday Street, Birmingham 1.

MR. F. C. BRABY has been elected as the first Chairman of the Hot Dip Galvanizers' Association.

MR. K. C. CHOUDHURI has been elected an Associate of the Institution of Metallurgists.

MR. R. E. COCKADAY has been appointed a Scientific Officer at the Ministry of Supply, Chemical Inspectorate, Springfields, Salwick, near Preston, Lancs.

MR. E. C. ELLWOOD has been awarded the degree of Doctor of Philosophy by the University of London, and has also been awarded a Travelling Fellowship by the Nuffield Foundation, to study extraction metallurgy in Rhodesia and South Africa.

DR. U. R. EVANS, Reader in the Science of Metallic Corrosion at Cambridge University, has been elected a Fellow of the Royal Society.

MR. G. GODDARD has taken up an appointment as Senior Scientific Officer with the Ministry of Supply.

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MR. H. B. GRAINGER has left the employment of the Northern Aluminium Company, Ltd., to take up an appointment in the Research Department of Imperial Chemical Industries, Ltd., Metals Division, Witton, Birmingham.

MR. A. T. GREEN has been awarded the honorary degree of D.Sc. of Leeds University.

PROFESSOR J. NEILL GREENWOOD, Professor of Metallurgy at the University of Melbourne, who has been awarded a Nuffield Foundation Fellowship in extraction metallurgy, is due to arrive in London on 22 April.

MR. VERNON HARBORD has been elected a Vice-President of the Institution of Mining and Metallurgy.

MR. M. A. HAUGHTON has left the Bristol Aeroplane Company, Ltd., and has taken up a post with the British Non-Ferrous Metals Research Association.

MR. H. R. HEAP has been appointed a Metallurgist at the Nelson Research Laboratories of the English Electric Company, Ltd., Stafford.

MR. T. A. HENDERSON has been awarded a Vacation Scholarship by the Nuffield Foundation, to study copper smelting in Northern Rhodesia.

MR. J. Y. HIGGS has been awarded the degree of B.Sc. (Eng.), with Honours in Metallurgy, of London University.

DR. V. J. D. HILL, one-time Chief Metallurgist of Philips Electrical, Ltd., has resigned his position as Technical-Commercial Manager of the Industrial Department, Philips Electrical, Ltd., and joined Thermal Welding Products of Benoni, South Africa, as Manager of the Electric Welding Division.

MR. S. HISCOCK has left the Arc Manufacturing Company, Ltd., and is now employed as a Research Assistant at the British Non-Ferrous Metals Research Association.

MR. O. W. HUMPHREYS has been appointed Manager of the Research Laboratories of the General Electric Company, Ltd., Wembley.

MR. E. L. JAMES has relinquished his post with Forgings and Presswork, Ltd., Birmingham, and has joined John Gamington and Sons, Ltd., Bromsgrove, as Assistant Metallurgist.

MR. RUSSELL JAY has left the Morgan Crucible Company, Ltd., to join the Liaison Staff of the British Non-Ferrous Metals Research Association.

MISS ANNA LING LEE left Birmingham University last December, after obtaining the M.Sc. degree, and is now working at Cambridge.

DR. F. R. MORRAL has accepted an appointment as Associate Professor of Materials Engineering with the College of Applied Science of Syracuse University. For several years Dr. Morral had been Group Leader of the Metal Trades Laboratory of the Technical Service and Development Division of the American Cyanamid Company in the laboratories at Stamford, Conn.

MR. D. S. MURTY has been transferred from Ambarnath to the Inspectorate of Metal and Steel, Ishapore, Nawabganj P.O., West Bengal.

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MR. D. V. REDDI has been elected an Associate of the Royal Institute of Chemistry of Great Britain and Ireland.

MR. R. R. ROBERTS has been awarded the degree of M.A. of Cambridge University.

DR. E. C. ROLLASON has been elected Chairman of the Editorial Committee of the Institute of Welding and also a British delegate on the Commission on Weldability of the International Institute of Welding.

MR. M. B. SANDERS has been appointed Laboratory Technician in the Department of Metallurgy and Fuel Technology, University College, Cardiff.

DR. M. SIMNAD has left Cambridge and is now working at the Metals Research Laboratory, Carnegie Institute of Technology, Pittsburgh, Pa., U.S.A., as a Guest Fellow.

MR. ROBERT A. STAUFFER has been elected Vice-President and Director of Research of the National Research Corporation, Cambridge, Mass., U.S.A. A graduate of Harvard University, he has been associated with the Corporation since 1942.

MR. JOHN P. SUTCLIFFE has taken up the appointment of Production Superintendent at Noranda Copper and Brass, Ltd., Montreal East, Que., Canada.

DR. C. SYKES has been nominated by the Iron and Steel Institute as its representative on the General Board of the National Physical Laboratory for a 5-year period from 1 January 1949. He succeeds Professor J. H. Andrew.

MR. J. W. TAYLOR has been awarded the B.Sc. degree, with Honours in Metallurgy, of Glasgow University, and also the Associateship of the Royal Technical College, Glasgow.

MR. F. M. THOMAS has left the Appleby-Frodingham Steel Company, Ltd., to take up the post of Assistant Metallurgist in the Research Department of Needle Industries, Ltd., Studley, Warwickshire.

DR. J. H. WATSON is paying a visit to the United States and Canada and expects to return to England early in May.

MR. A. D. WILKS was appointed Superintendent of the Ordnance Factory, Katni (C.P.), India, with effect from 1 July 1948.

DEATHS

The Editor regrets to announce the deaths of the undermentioned members :

MR. J. H. G. MONYPENNY, Assoc.Met., Metallurgist of Brown Bayley's Steel Works, Ltd., Sheffield, on 2 March 1949.

MR. WILLIAM PATERSON, J.P., of Glasgow, on 21 January 1949.

MR. W. F. ROWDEN, a Director of the Climax Molybdenum Company of Europe, Ltd., of London, on 17 March 1949.

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MR. WILLIAM G. WAGNER, Managing Director of George T. Holloway and Company, Ltd., Consulting Metallurgists, of London, on 19 March 1949. He was elected a member of the Institute in 1917.

Note : Will members (in addition to informing the Institute's administrative department of changes of address, occupation, &c., kindly notify the Editor, *separately*, of all changes of occupation, appointments, awards of honours and degrees, &c., as these matters interest their fellow members.

MR. ARTHUR SMITH

The Editor regrets that, as a result of inaccurate information supplied to the Institute, the death was reported in the January 1949 issue of the *Journal* of Mr. Arthur Smith. This entry should be deleted, and the Editor expresses his apologies to Mr. Smith that this error should have occurred. Mr. Smith is, moreover, not now connected with Messrs. Ductile Steels, Ltd.

OTHER NEWS

MOND NICKEL FELLOWSHIPS

The Mond Nickel Fellowships Committee invites applications for the award of Mond Nickel Fellowships for the year 1949. Awards will be made to selected applicants of British nationality educated to University degree or similar standard, though not necessarily qualified in metallurgy, who wish to undergo a programme of training in industrial establishments; they will normally take the form of travelling Fellowships: awards for training at Universities may be made in special circumstances. There are no age limits, though awards will seldom be given to persons over 35 years of age. Each Fellowship will occupy one full working year. The Committee hopes to award up to five Fellowships each year, of an average value of £750 each.

Mond Nickel Fellowships will be awarded in furtherance of the following objects:

(a) To allow selected persons to pursue such training as will make them better capable of applying the results of research to the problems and processes of the British metallurgical and metal-using industries.

(b) To increase the number of persons who, if they are subsequently employed in executive and administrative positions in the British metallurgical and metal-using industries, will be competent to appreciate the technological significance of research and its results.

(c) To assist persons with qualifications in metallurgy to obtain additional training helpful in enabling them ultimately to assume executive and administrative positions in the British metallurgical and metal-using industries.

(d) To provide training facilities whereby persons qualified in sciences other than metallurgy may be attracted into the metal-

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lurgical field and may help to alleviate the shortage of qualified metallurgists available to industry.

Applicants will be required to state the programme of training in respect of which they are applying for an award, as well as particulars of their education, qualifications, and previous career. Full particulars and forms of application can be obtained from the Secretary, Mond Nickel Fellowships Committee, 4 Grosvenor Gardens, London, S.W.1. Completed application forms will be required to reach the Secretary of the Committee not later than 1 June 1949.

CHEMICAL SOCIETY RESEARCH FUND

The Research Fund of the Chemical Society provides grants for the assistance of research in all branches of chemistry. About £700 per annum is available for this purpose, the income being derived from a donation of the Worshipful Company of Goldsmiths, from the Perkin Memorial Fund, and from other sources.

Applications for grants will be considered in June next and should be submitted on the appropriate form not later than Tuesday, 10 May 1949. Applications from Fellows will receive prior consideration.

Forms of application together with the regulations governing the award of grants may be obtained from the General Secretary, The Chemical Society, Burlington House, Piccadilly, London, W.1.

INSTITUTION OF METALLURGISTS : EXAMINATIONS 1949

The next examinations for the Licentiate and Associateship of the Institution will be held in September 1949. Candidates must submit their applications for permission to enter the examinations before 1 June 1949.

Examinations for the Fellowship will also be held in September 1949. Intending candidates should apply for permission to enter the examinations, stating the branch of metallurgy in which they wish to be examined.

Application forms, and particulars of fees payable, may be obtained from the Registrar-Secretary, Institution of Metallurgists, 4 Grosvenor Gardens, London, S.W.1.

HOT-DIP GALVANIZERS' ASSOCIATION

The Hot-Dip Galvanizers' Association (which will be a member of the Zinc Development Association) has been formed to promote the development of existing and new uses of hot-dip galvanized coatings and to improve galvanizing technique. Mr. F. C. Braby, of Frederick Braby and Co., Ltd., has been elected as first Chairman of the Association, with Mr. A. H. Thompson, of General Galvanizers, Ltd., as Deputy Chairman.

All general galvanizers may apply to be members of the Association, the address of which is Lincoln House, Turl Street, Oxford.

DIARY FOR MAY

INSTITUTE MEETING

WEDNESDAY, 25 MAY

May Lecture, by Sir Edward Appleton. (Royal Geographical Society, Kensington Gore, London, S.W.7 (near the Albert Hall), at 6 p.m.)

LOCAL SECTION MEETING

TUESDAY, 17 MAY

South Wales Local Section.—Visit to the works of the Anglo-Celtic Watch Co., Ltd., Gurnos Works, Ystradgynlais, Swansea. (Assemble at the works at 2 p.m.)

OTHER MEETINGS

MONDAY, 2 MAY—FRIDAY, 13 MAY

British Industries Fair at Castle Bromwich, Birmingham, and at Earl's Court and Olympia, London.

TUESDAY, 3 MAY

Institution of Electrical Engineers, Measurements Section.—Professor G. W. O. Howe: "Some Electromagnetic Problems". (Savoy Place, London, W.C.2, at 5.30 p.m.)

THURSDAY, 5 MAY

Leeds Metallurgical Society.—Annual General Meeting and Students' Papers. (Chemistry Dept., The University, Leeds 2, at 7 p.m.)

SUNDAY, 8 MAY

Royal Aeronautical Society.—Annual Garden Party. (White Waltham Aerodrome, near Maidenhead.)

MONDAY, 9 MAY

British Iron and Steel Research Association.—Two-day Conference on Metallurgical Applications of Optical Techniques. First day. (Ashorne Hill, Leamington Spa.)

TUESDAY, 10 MAY

British Iron and Steel Research Association.—Conference on Metallurgical Applications of Optical Techniques. Second, and last, day. (Ashorne Hill, Leamington Spa.)

Chemical Engineering Group (Society of Chemical Industry).—W. Barr: "Manufacture and Use of Stainless-Clad Steel". (Geological Society, Burlington House, London, W.1, at 5.30 p.m.)

WEDNESDAY, 11 MAY

Institute of Fuel, North-Western Section.—Full-day conference on "Combined Heat and Power Supplies". (Engineers' Club, Albert Sq. Manchester, at 11 a.m. and 2 p.m.)

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THURSDAY, 12 MAY

British Iron and Steel Research Association.—Two-day Conference on “Cupola and Converter Refractories”. First day. (Ashorne Hill, Leamington Spa.)

FRIDAY, 13 MAY

British Iron and Steel Research Association.—Conference on “Cupola and Converter Refractories”. Second, and last, day. (Ashorne Hill, Leamington Spa.)

MONDAY, 16 MAY

Electrodepositors' Technical Society.—Spring Meeting. W. N. Bradshaw, B.Sc., and Dr. S. G. Clarke: “Anodizing: Investigations on the Anode Film and its Formation”. (Northampton Polytechnic, St. John St., Clerkenwell, London, E.C.1, at 6 p.m.)

WEDNESDAY, 18 MAY

Geological Society of London.—Ordinary Evening Meeting. (Burlington House, Piccadilly, London, W.1, at 5 p.m.)

THURSDAY, 19 MAY

Institution of Mining and Metallurgy.—General Meeting. (Geological Society, Burlington House, London, W.1, at 5 p.m.)

APPOINTMENTS REQUIRED

ELECTRICAL ENGINEER requires responsible executive or technical sales position. 14 years' practical experience physical metallurgy and application all classes metals to light engineering. Some business experience. Reply to Box No. 262, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

METALLURGIST, B.Sc.(Hons.), A.I.M. 28. Single. Works and research experience. Requires position with responsibility. Particularly interested in development work. Location immaterial. Box No. 264, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

APPOINTMENTS VACANT

To conform to the requirements of the Control of Engagements Order, 1947, these advertisements are published for the information only of those who are “excepted persons” under the Order.

CAMBRIDGE UNIVERSITY. The Appointments Committee of the Faculty of Physics and Chemistry hope soon to be in a position to appoint a University Demonstrator in Metallurgy, to hold office from 1 October 1949. The appointment will be subject to the Statutes and Ordinances of the University and, in particular, subject to approval by His Majesty in Council of proposed new Statutes relating to this office. The prime stipend of a University Demonstrator will be £600 a year, rising to £650 after three years, or, if the Demonstrator is ordinarily resident in College, £500 rising to £550 after three years. A non-pensionable allowance of £50 a year for each dependent child is also paid.

The prime stipend of a University Demonstrator who is a Fellow with dividend is subject to a deduction of £300 a year or, in a particular case, on the application of the Demonstrator to the Financial Board, of an amount of £50 less than the actual dividend, whichever is the less. The prime stipend may also be subject to a deduction if the Demonstrator holds a substantial College administrative office.

Candidates are requested to state their age and give the names of not more than three referees, together with any evidence of qualifications they may desire to submit. Applications should reach Dr. F. B. Kipping, Secretary of the Appointments Committee of the Faculty of Physics and Chemistry, University Chemical Laboratory, Pembroke Street, Cambridge, on or before Saturday, 21 May 1949.

NEWS AND ANNOUNCEMENTS

APPLICATIONS are invited by the Standard Telecommunication Laboratories, Limited, for a **METALLURGIST** or **CHEMIST** to assist with a programme of preparation and testing of specialized materials. Applicants should preferably have a University degree, but real interest in experimental work is more important than academic qualifications. Salary in accordance with qualifications and experience. Applications should be made to the Personnel Manager, Standard Telecommunication Laboratories, Limited, Progress Way, Enfield, Middlesex.

METALLURGICAL CHEMIST for smelting works in Singapore. B.Sc. or equivalent qualification. Salary according to age and experience. Write Box I.N.W., c/o 95 Bishops-gate, London, E.C.2.

METALLURGIST (25-35 years) required for Non-Ferrous Smelters Research Department in South of England. Duties will include supervision of pilot scale experimental work and tests on metallurgical plant; also of junior staff and operators employed. Successful applicant will be expected to keep up to date in his line and take a general interest in the industry. Honours Degree in Metallurgy (or Chemistry with comparable Metallurgical experience) essential. Some experience of pilot or full-scale plant operation or investigation desirable. Commencing salary in range £500-£600 per annum for five-day week, and prospects are attractive. Good technical library and society. Contributory Pension Scheme. Write marking envelope "Confidential—Ref. IM/M" and giving full particulars of experience and qualifications to Box No. 263, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

MINISTRY OF SUPPLY invites applications for unestablished appointments in the following grades for work on the physics of metals in Research and Development Establishments in London and S. England:

Senior Scientific Officer.	London salary range	£700-£900
Scientific Officer.	"	£400-£650
Experimental Officer.	"	£525-£675
Assistant Experimental Officer.	"	£230 (at age 18)—£490

Rates in the provinces and for women are somewhat lower. Starting pay not necessarily at minima quoted.

Candidates should have practical experience of the working and deformation of metals or experimental technique in determining alloy constitution, or some knowledge of powder metallurgy, metallography, X-ray crystal analysis, or refractory materials.

For the Scientific Officer grades a good Honours degree in metallurgy, physics, or chemistry is required. Appointment in these grades carries F.S.S.U. benefits.

For the Experimental Officer grades the minimum qualification is Higher School Certificate or Higher National Certificate in chemistry or equivalent qualification in metallurgy.

Application forms obtainable from Technical and Scientific Register (K), York House, Kingsway, London, W.C.2, quoting F.1190/48A. Closing date 21 days from the date of this publication.

MINISTRY OF SUPPLY. Applications are invited for the following appointment in the Division of Atomic Energy (Production) at Springfields Factory, Salwick, Nr. Preston, Lancs.

MANAGING CHEMIST to take charge of the Metallurgical Development Laboratories at the above factory. Candidates must have either an honours degree in metallurgy, engineering, chemistry, physics, or chemical engineering, or have associateship of the Royal Institute of Chemistry, the Institution of Metallurgists, or the Institute of Physics, and at least three years' experience in a factory or industrial laboratory; or have corporate membership of the Institution of Chemical Engineers. Alternatively, they should either be corporate members of the Institutions of Civil, Mechanical, or Electrical Engineers, or have passed examinations recognized by any of these Institutions as granting exemption from sections A and B of their examinations for associate membership. Applicants must be capable of directing staff in the experimental metallurgy involved in the development of production processes. Experience in the following fields is desirable—corrosion, metal fabrication, welding and joining of metals, high frequency furnace melting of metals, and general metallurgical investigations.

Salary will be assessed according to qualifications and experience within the range £997-£1192 per annum.

Candidates will normally be confined to natural-born British subjects, born within the United Kingdom or in one of the self-governing Dominions, or parents also born in the United Kingdom or one of the self-governing Dominions.

Applications should be addressed to Staff Section, Ministry of Supply, Division of Atomic Energy (Production), Risley, Nr. Warrington.

BULLETIN ANALYTIQUE

Publication of the Centre National de la Recherche Scientifique, France

The *Bulletin Analytique* is an abstracting journal which appears monthly in two parts, Part I covering scientific and technical papers in the mathematical and physical sciences and their applications, Part II the biological sciences.

The *Bulletin*, which started on a modest scale in 1940, with an average of 10,000 abstracts per part, now averages 35,000 to 45,000 abstracts per part. The abstracts summarize briefly papers in scientific and technical periodicals received in Paris from all over the world, and cover the majority of the more important journals in the world scientific press. The scope of the *Bulletin* is constantly being enlarged to include a wider selection of periodicals.

The *Bulletin* thus provides a valuable reference book both for the laboratory and for the individual research worker who wishes to keep in touch with advances in subjects bordering on his own.

A specially interesting feature of the *Bulletin* is the microfilm service. A microfilm is made of each article as it is abstracted, and negative microfilm copies or prints from microfilm can be purchased from the editors.

The subscription rates for Great Britain are 4000 frs. (£5) per annum for each part. Subscriptions can also be taken out to individual sections of the *Bulletin* as follows:

	<i>frs.</i>	£	<i>s.</i>	<i>d.</i>
Pure and Applied Mathematics—Mathematics— Mechanics	550	14	6	
Astronomy—Astrophysics—Geophysics	700	18	0	
General Physics—Thermodynamics—Heat— Optics—Electricity and Magnetism	900	1	2	6
Atomic Physics—Structure of Matter	325	8	6	
General Chemistry—Physical Chemistry	325	8	6	
Inorganic Chemistry—Organic Chemistry— Applied Chemistry—Metallurgy	1800	2	5	0
Engineering Sciences	1200	1	10	0
Mineralogy—Petrography—Geology— Palaeontology	550	14	6	
Biochemistry—Biophysics—Pharmacology	900	1	2	6
Microbiology—Virus and Phages	600	15	6	
Animal Biology—Genetics—Plant Biology	1800	2	5	0
Agriculture—Nutrition and the Food Industries	550	14	6	

Subscriptions can be paid directly to the editors: Centre National de la Recherche Scientifique, 18 rue Pierre-Curie, Paris 5ème. (Compte-chèque-postal 2500-42, Paris), or through Messrs. H. K. Lewis & Co., Ltd., 136 Gower St., London, W.C.1.

NOTICE TO AUTHORS OF PAPERS

1. Papers will be considered for publication from non-members as well as from members of the Institute. They are accepted for publication in the *Journal*, and not necessarily for presentation at any meeting of the Institute, and should be addressed to The Editor of Publications, The Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.
2. Papers suitable for publication may be classified as:
 - (a) Papers recording the results of original research ;
 - (b) First-class reviews of, or accounts of, progress in a particular field ;
 - (c) Papers descriptive of works methods, or recent developments in metallurgical plant and practice.
3. Manuscripts and illustrations should be submitted in duplicate. MSS. must be typewritten (*double-line spacing*) on one side of the paper only, and authors are required to sign a declaration that neither the paper nor a substantial part thereof has been published elsewhere. MSS. not accepted are normally returned within 3 months of receipt.
4. Synopsis. Every paper must have a synopsis which, in the case of results of research, should state its objects, the ground covered, and the nature of the results. The synopsis will appear at the beginning of the paper, and should be in a form suitable for use by abstracting organizations.
5. References must be collected at the end of the paper, and each must have a number. Initials of authors must be given, and the Institute's official abbreviations for periodical titles (as used in *Met. Abs.*) must be used where known. References must be set out in the style :
 1. W. Hofmann and W. Jäniche, *Z. Metallkunde*, 1936, **28**, 1 (i.e. year, volume, page).
6. Illustrations. Each illustration must have a number and description ; only one set of numbers must be used in one paper. The set of *line figures* sent for reproduction must be drawn in Indian ink on smooth white Bristol board, good-quality drawing paper, co-ordinate paper, or tracing cloth, which are preferred in the order given. Co-ordinate paper, if used, must be blue-lined with the co-ordinates to be reproduced *finely* drawn in Indian ink. All lettering and numerals, &c., should preferably be in *pencil*. Figures should be drawn approximately twice the size intended for reproduction. *Photographs* must be restricted in number, owing to the expense of reproduction, and trimmed to the smallest possible of the following sizes, consistent with adequate representation of the subject : 3 in. deep by 4 in. wide (two photomicrographs to a plate) ; 3 in. deep by 2½ in. wide (four to a plate) ; 2 in. deep by 2½ in. wide (six to a plate). Magnifications of photomicrographs must be given in each case. Photographs for reproduction should be loose, not pasted down (and not fastened together with a clip, which damages them), and the figure number should be written on the back of each. Legends should be given to photomicrographs, but lengthy descriptions should be avoided owing to the very limited space available on the plates. Illustrations that are not *essential* to the appreciation of the paper should not be included. Only in exceptional cases will illustrations be reproduced if already printed and readily available elsewhere.
7. Tables or Diagrams. Results of experiments, &c., may be given in the form of tables or figures, *but* (unless there are exceptional reasons) *not both*.
8. Overseas Authors. Authors resident in countries distant from Great Britain are requested to name, if possible, agents in Britain to whom may be referred matters concerning their papers, including proofs for correction. Translations from foreign languages should preferably be accompanied by a copy of the MS. in the language of the author.
9. Reprints. Individual authors are presented with 50, two authors with 70, and three with 90, reprints (in cover) from the *Journal*. Limited numbers of additional reprints can be supplied at the author's expense if ordered before proofs are passed for press. (Orders should preferably be placed when submitting MSS.)
10. Prizes for Papers. Each year awards are made of the following for papers published in the *Journal* : (a) Capper Pass Award for papers on processes or plant used in the fabrication of non-ferrous metals ; (b) W. H. A. Robertson Medal and Premium for papers on engineering aspects of non-ferrous metallurgy.

THE INSTITUTE OF METALS

President :

Sir ARTHUR SMOUT, J.P.

Secretary and Editor of Publications :

Lieut.-Colonel S. C. GUILLAN, T.D.

Assistant Editor :

Major W. G. ASKEW, M.C.

Assistant Secretary :

Major R. E. MOORE

Administrative and Editorial Offices :

4 GROSVENOR GARDENS, LONDON, S.W.1

Telephone :

SLOANE 6233

INSTITUTE NEWS AND ANNOUNCEMENTS

AUTUMN MEETING, PARIS

Changes have been made in the provisional programme of the Paris meeting, which was published in the April issue of the *Journal*. As stated, the meeting will commence on Monday, 3 October, and it is hoped that members and their ladies will travel on Saturday, 1 October, or Sunday, 2 October, to be present in Paris on the morning of the opening day of the meeting.

The meeting will now be in two parts : *Part I*. From Monday, 3 October to Saturday, 8 October in Paris : meetings and discussions will be held, and visits to works or other places of interest and social functions will take place in Paris or the vicinity. The Autumn Lecture, by Professor G. Chaudron, will be delivered on the evening of Monday, 3 October, and technical sessions will be held on three of the mornings in that week. Members will join with the members of the Société Française de Métallurgie in the Osmond Centenary ceremony, at which the President of the Republic is expected to be present. *Part II*, which will commence on Sunday, 9 October, or Monday, 10 October, will consist of a series of short tours to metallurgical centres and other places of interest outside Paris.

Special arrangements are being made for the entertainment of ladies. There will be social functions on certain evenings, but three evenings will be free in Paris so that members may be able to make their own plans.

A programme, with reply form, giving full particulars of the meeting will be circulated to all members at an early date. It is hoped that there will be a large attendance, particularly from the British Isles and the Continent of Europe.

HONORARY CORRESPONDING MEMBERS TO THE COUNCIL

The following members have been elected Honorary Corresponding Members to the Council for their respective countries :

Belgium : M. HENRI FÉRON, Administrateur-Directeur, Visseries et Tréfileries Réunis S.A., Haren, Brussels.

Holland : Mr. MAX HAMBURGER, Director, Royal Nederlandsche Lood-en Zinkpletterijen voorheen A. D. Hamburger, Utrecht.



FIG. A.—THE W. H. A. ROBERTSON MEDAL (Full-size).
By arrangement with the Deputy Master of the Royal Mint. Artist : Mr. Percy Metcalfe, C.V.O.

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Italy : Dott. LENO MATTEOLI, Vice-Director, Istituto Scientifico Tecnico Ernesto Breda, Sesto S. Giovanni, Milano.

Spain : Professor J. ORLAND, M.Sc., M.A., Ph.D., D.D., Professor and Head of the Department of Metallography and Strength of Materials, Instituto Católico de Artes e Industrias, Madrid.

Sweden : Professor AXEL HULTGREN, Professor of Metallography, K. Tekniska Högskolan, Stockholm (additional Honorary Corresponding Member).

ELECTION OF COUNCIL

The following have been elected to fill vacancies on the Council with effect from the 1949 Annual General Meeting of the Institute :

President :

Sir Arthur Smout, J.P.

Vice-Presidents :

Major C. J. P. Ball, D.S.O., M.C.

C. J. Smithells, M.C., D.Sc.

Ordinary Members of Council :

E. A. Bolton, M.Sc.

C. H. Davy.

H. W. G. Hignett, B.Sc.

A. G. Quarrell, D.Sc., Ph.D., A.R.C.S., D.I.C.

COUNCIL : RESIGNATION

The Council has accepted, with much regret, the resignation, through ill-health, of Professor Leslie Aitchison as an Ordinary Member of Council. In due course, in accordance with Article 28, the Council will nominate a member to fill the vacancy caused by Professor Aitchison's resignation.

The Council desires to record its deep appreciation of the services that Professor Aitchison has rendered to the Institute not only as a Member of Council but also in connection with the joint committee on metallurgical education.

THE W. H. A. ROBERTSON MEDAL

Members may be interested to see, on the opposite page, pictures of the obverse and reverse of the W. H. A. Robertson Medal which, with a premium, is the gift of the Directors of Messrs. W. H. A. Robertson and Company, Ltd., of Bedford. The medal, the dies for which are being prepared at the Royal Mint, was designed by the well-known artist Mr. Percy Metcalfe, C.V.O.

The W. H. A. Robertson Bronze Medal and Premium will be awarded annually by the Council of the Institute of Metals to the author or authors of the paper adjudged to be of the highest merit contributed to the *Journal of the Institute of Metals* on engineering aspects of non-ferrous metallurgy. For the first award, the Medal Committee will consider all papers published in the *Journal* from March 1948 to August 1949, inclusive. The award is open to persons of any nationality and to non-members as well as to members of the Institute.

The figure on the medal represents Hephaistos, the god of fire and smiths, who was called Vulcanus by the Romans. According to Homer he was the son of Zeus (Jupiter) and of Hera (Juno). Later traditions (Hesiod) state, however, that he had no father and that Hera gave birth to him independently of Zeus, of whom she was jealous. Homer says he was born lame and weak and that he dwelt with the marine divinities Thetis and Eurynome for 9 years in a grotto beneath Oceanus, where he fashioned a number of exquisite works of art, among them a golden throne with invisible chains. Later he was recalled to Olympus, where he became the great artist of the gods.



FIG. B.

The sojourn of Hephaistos in the cavern under the sea and his fondness for the island of Lemnos is, in all probability, based on volcanic phenomena, the submarine activity of volcanic fires, and the natural features of the island of Lemnos itself. Here there were annual festivals in his honour. In one, all fires were put out for nine days, during which rites of atonement and purification were performed. Then fresh fuel was brought on a sacred ship from Delos, the fires were rekindled, and a new life began. In October the smiths and smelters celebrated the Chalkeia, a feast of metal workers; at the Apātūria sacrifices were offered to him, among other gods, as the giver of fire; torches were lit and hymns sung, and at the Hephaistia, finally, there was a torch race in his honour.

Hephaistos appears to have been originally simply the god of fire, but as fire is indispensable in working metals he was afterwards regarded as an artist. He made palaces of brass for himself

and the other deities. His palace in Olympus was imperishable. It contained his workshop with an anvil and 20 bellows, which worked spontaneously at his bidding "blowing upon the melting pots, sending forth deft blasts of varying strength now to further his labours and now again, however Hephaistos might will it, according as his work went on. And on the fire he threw tough bronze and tin and precious gold and silver." He made the armour of Achilles, the ægis of Zeus, the sceptre of Agamemnōn, the fatal necklace of Harmonia, the fire-eating bulls of Aeëtes, King of Colchis. He had a forge also on Mount Mosychlos in Lemnos, possibly one under Etna in Sicily and on the sacred island of Hephaistos in the Lipari Islands where the Cyclopes were his workmen and servants. To help his lameness he made, according to Homer, two golden maidens with the power of motion, on whom he leaned when he walked.

The lettering on the medal was the subject of considerable discussion, because the name was spelt very differently at different periods in Greek history and in different parts of the Greek world. Ultimately, on the advice given by Dr. L. R. Palmer, Professor of Greek at King's College, London, it was decided to adopt the spelling which appears on the inside of a basin of the 5th century B.C. (see Fig. B), which is illustrated in Roscher's "Lexikon der Mythologie", p. 2058.

PERSONALITIES

PROFESSOR H. K. WORNER, D.Sc.

Professor Howard Knox Worner, who has been elected Honorary Corresponding Member to the Council for Australia, was born on 3 August 1913, at Swan Hill, Vic., Australia. He was educated at a small school in Northern Victoria, Bendigo Technical School (1929-30), and Bendigo School of Mines (1930-32). In 1932 he qualified for the diplomas in Applied Chemistry and Metallurgy and was Gold Medalist of the Bendigo School of Mines.

Having been awarded a Senior Scholarship to the University of Melbourne, he entered the Science Course with the status of a second-year student, taking chemistry and metallurgy as major subjects. He graduated B.Sc. in December 1934, with First-Class Honours and the Exhibition, and a special bursary in metallurgy. In March 1936 he was awarded the degree of M.Sc. with First-Class Honours and the Final Exhibition. He was the joint recipient, in 1940, of the David Syme Research Prize, and in May 1942 was awarded the degree of Doctor of Science. For this degree, 22 published papers



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were presented covering (i) the properties of lead and lead-rich alloys, and (ii) the properties of dental alloys and related materials. He received the doctorate at the age of 28, and is the youngest D.Sc. graduate of the University of Melbourne.

From 1935 to 1936 Dr. Worner held the appointments of Demonstrator in Physical Metallurgy at the University of Melbourne and Evening Lecturer in Heat-Treatment at the Melbourne Technical College, and from 1937 to 1938 was Lecturer in Metallurgy in the University of Melbourne. From 1935 to 1938 he worked under the direction of Professor J. Neill Greenwood on the physical properties of lead and its dilute alloys, with particular reference to the effect of various elements on the creep characteristics of lead. Two papers on this work (one with J. Neill Greenwood and the other with Hill W. Worner) were published in the *Journal of the Institute of Metals* (1939, vol. 65, and 1940, vol. 66, respectively). Five other papers on the lead research were published in the *Proceedings of the Australasian Institute of Mining and Metallurgy*.

Dr. Worner was, from 1939 to 1946, Research Fellow of the National Health and Medical Research Council and Officer-in-Charge of the Dental Materials Laboratory in the Australian College of Dentistry. This work laid the foundations for the establishment of the Commonwealth Bureau of Dental Standards. Early in the 1939-45 war he was appointed Honorary Scientific Consultant to the Medical Equipment Control Committee and the Defence Services. He served for 3 months in New Guinea and Bougainville with H.M. Forces, as Scientific Liaison Officer investigating tropical deterioration of medical and dental supplies. During the period 1939-1946, 33 papers (11 with collaborators) were published in various dental journals, dealing with the results of researches on dental materials. The fields covered included gypsum products and acrylic resins.

In 1946, Dr. Worner was granted a Travelling Fellowship by the Commonwealth Department of Health "in recognition for services rendered during the war", and he took the opportunity to visit centres of academic and metallurgical interest in England, Switzerland, and the United States of America. While abroad, he was appointed to succeed Professor J. Neill Greenwood as the second occupant of the Chair of Metallurgy in the University of Melbourne, and assumed his duties on 1 January 1947. He is also Honorary Scientific Advisor to the Commonwealth Bureau of Dental Standards.

Elected a member of the Institute of Metals in 1936, he is also a member of the Iron and Steel Institute, a Fellow of the Australian Chemical Institute, Fellow of the Institution of Metallurgists, member of the American Institute of Mining and Metallurgical Engineers, member of the Australasian Institute of Mining and Metallurgy, Honorary Member of the Australian Dental Association, Honorary Member of the International Association for Dental Research, Vice-President of the Melbourne Branch of the Australian Institute of Metals, and Councillor of the Australian Institute of Foundrymen.

Professor Worner married on 11 December 1937, Rilda Beryl Muller, and has two sons and one daughter.

NEWS AND ANNOUNCEMENTS

MEMBERSHIP DEVELOPMENT

The present is a particularly suitable time at which to join the Institute, as its financial year commences on 1 July. The Secretary will be pleased to supply application forms.

ELECTION OF MEMBERS, ASSOCIATE MEMBERS AND STUDENT MEMBERS

The following 28 Ordinary Members, 1 Associate Member, and 14 Student Members were elected on 14 April 1949 :

Ordinary Members

- BAILEY, Kenneth George Desplan, Metallurgist, Folland Aircraft, Ltd., Southampton.
- CANTRELL, John, Metallurgist, The Carborundum Company, Ltd., Manchester.
- CARTWRIGHT, Leonard Octavius, Assistant Factory Manager, Imperial Chemical Industries, Ltd., Metals Division, Selly Oak, Birmingham.
- CHARLES, Hadyn, Chief Works Inspector, Imperial Chemical Industries, Ltd., Metals Division, Swansea, Glamorganshire.
- GARDNER, Edmund Paley Starkie, B.Sc., Engineer, The Anglo-Iranian Oil Company, Ltd., London.
- GRENFELL, William Harold, Production Manager, Imperial Chemical Industries, Ltd., Metals Division, Swansea, Glamorganshire.
- HARRISON, Thomas, Foundry Supervisor, Serck Radiators, Ltd., Warwick Road, Birmingham 11.
- HOUSEHOLDER, Leland E., B.S., Assistant Chief Metallurgist, Reynolds Metals Company, Brookfield, Ill., U.S.A.
- HUMPHREYS, Olliver William, B.Sc., Manager, The Research Laboratories, General Electric Company, Ltd., Wembley, Middlesex.
- JABLONSKI, Stanislaw, Director of Institute of Metallography and Metal Working, Warsaw, Poland.
- JOHNS, Neil, Production Supervisor, Johnson, Matthey and Company, Ltd., 73-83 Hatton Garden, London, E.C.1.
- KASZ, Frank, B.Sc., Metallurgist, The British Aluminium Company, Ltd., Bainsford, Falkirk.
- KUNDU, Kishori Mohan, Superintendent, Melting Shop, Indian Government Mint, Calcutta, India.
- LARKE, Eustace Charles, Metallurgical Engineer, Research Department, Imperial Chemical Industries, Ltd., Metals Division, Witton, Birmingham.
- LAWRENCE, Charles Sydney, Senior Executive Officer, Inspectorate of Armaments, Woolwich.
- LEWIS, Harry, B.Sc., Research Metallurgist, The Mond Nickel Company, Ltd., Research and Development Department, Wiggins Street, Birmingham 16.
- MCCREDIE, Francis Ian, B.Sc., Australian Aluminium Company, Pty., Ltd., Unwin Street, Granville, N.S.W., Australia.
- MATTHEWS, Roy Glyn Linton, Metallurgist, Imperial Chemical Industries, Ltd., Metals Division, Landore, Swansea, Glamorganshire.

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- NEHRENBERG, A. E., B.S., Supervisor of Research Laboratory, Crucible Steel Company of America, Harrison, N.J., U.S.A.
- PAUL, Nripendra Chandra, M.Sc., Metallurgical Chemist, Laboratory, Ordnance Factory, Ambarnath (G.I.P.), Bombay, India.
- PETTERSEN, Alf, M.Sc., Chief Metallurgist, Stavanger Electrostaalverk A/S, Norway.
- PRINCE, Richard William, Production Manager, Imperial Chemical Industries, Ltd., Metals Division, Broughton Copper Works, Salford, Manchester.
- SMITH, Harry, Director, Brontalloy, Ltd., Drighlington, near Bradford.
- SUGGITT, John Percy, Managing Director, Hotray Wires, Ltd., Hotray House, Chester Road, Manchester 15.
- TECTOR, Frederick James, B.Eng., Joint General Manager, Manganese Bronze and Brass Company, Ltd., Dock Road, Birkenhead, Cheshire.
- VERNON, William Thomas, Tool Room Superintendent, H. M. Hobson, Ltd., Hobson Works, Fordhouses, Wolverhampton.
- WHITEHEAD, Derek James, B.Sc., Metallurgical Research Department, Magnesium Elektron, Ltd., Clifton Junction, Manchester.
- ZYSS, Jozef-Tadeusz, General Manager, Norfolk Metals, Ltd., Effingham Road, Sheffield 9.

Associate Member

- SCHWARTZBART, Harry, B.S., M.S., Research Metallurgist, National Advisory Committee for Aeronautics. (Mail): 21770 Eaton Rd., Fairview Park 16, O., U.S.A.

Student Members

- ABLETT, John Reginald, Student of Metallurgy, The University, Manchester.
- BAILEY, Thomas, Student of Metallurgy, King's College, Newcastle-upon-Tyne.
- GOODWIN, Robert James, Student of Metallurgy, Cambridge University.
- GREGORY, Peter, Junior Metallurgist, Rotol, Ltd., Gloucester.
- L'APPELL, Peter Thomas, Student of Metallurgy, Royal School of Mines, Prince Consort Road, London, S.W.7.
- LOCK, Leonard Wallace, B.A., Metallurgist/Technical Assistant, Zinc Development Association, Oxford.
- MARSH, Peter Ronald, Student of Metallurgy, The University, Manchester.
- MILES, Peter Stewart, Student of Metallurgy, The University, Melbourne, Australia.
- MULLERY, Frank, Student of Metallurgy, The University, Birmingham.
- PARKES, Eric, Metallurgical Chemist, Fordath Engineering Company, Ltd., West Bromwich.
- SAMWAYS, Norman Leonard, Student of Metallurgy, Royal School of Mines, Prince Consort Road, London, S.W.7.
- TAYLOR, Frank Donald, Metallurgist, Imperial Chemical Industries, Ltd., Metals Division, Swansea, Glamorganshire.
- VARSHNEY, Raj Prakash, B.A., Student, College of Mining and Metallurgy, Benares Hindu University, Benares, India.
- WILLIAMS, Brian Edward, Metallurgical Laboratory Assistant, The Mint, Birmingham, Ltd., Birmingham.

NEWS AND ANNOUNCEMENTS

TOTAL MEMBERSHIP

The total active membership of the Institute on 30 April 1949 was exactly 3400.

COUNCIL 1949-50

President :

Smout, Sir Arthur, J.P., Director, Imperial Chemical Industries, Ltd., London; Director, Murex, Ltd., Rainham; Director, Murex Welding Processes, Ltd.; Director, Magnesium Elektron, Ltd., Manchester; Director, Pyrotenax, Ltd., Hebburn-on-Tyne; Member of Council, British Non-Ferrous Metals Research Association.

Past-Presidents :

Greenly, Lieut.-Colonel Sir John, K.C.M.G., C.B.E., M.A., Executive Chairman, Babcock and Wilcox, Ltd., London; Chairman, Calorizing Corporation of Great Britain, Ltd.; Chairman, British Non-Ferrous Metals Research Association.

Griffiths, Sir William, D.Sc., Chairman and Managing Director, The Mond Nickel Co., Ltd., London; Vice-President, International Nickel Company of Canada, Ltd.; Chairman, Henry Wiggin and Co., Ltd., Birmingham; Chairman, Birlec, Ltd., Birmingham; Director, Anglo-Metal Co., Ltd.; Vice-Chairman, British Non-Ferrous Metals Research Association.

Gueterbock, Colonel Sir Paul, K.C.B., D.S.O., M.C., T.D., D.L., J.P., M.A., A.D.C.; Managing Director, Capper Pass and Son, Ltd., Bristol; Chairman, Victor G. Stevens, Ltd., Gateshead; Chairman, Geo. Pizey and Son, Ltd., London; Chairman, The British Smelters' Association; Vice-Chairman, British Non-Ferrous Metals Research Association.

Vice-Presidents :

Ball, Major C. J. P., D.S.O., M.C., Chairman and Managing Director, Magnesium Elektron, Ltd.; Managing Director, F. A. Hughes and Co., Ltd.; Director, Sterling Metals, Ltd., Coventry; Director, The Distillers Co., Ltd.; Director, Basic Magnesium, Inc. (U.S.A.).

Cartland, John, M.C., M.Sc., Director and Works Manager, Fry's Metal Foundries, Ltd., London; Director and Works Manager, Eyre Smelting Co., Ltd., London.

Dorey, S. F., C.B.E., D.Sc., Wh.Ex., F.R.S., Chief Engineer Surveyor, Lloyd's Register of Shipping, London.

Murphy, A. J., M.Sc., Director, J. Stone and Co., Ltd., London; Chairman, Stone-Fry Magnesium, Ltd.; Director, Light Metal Forgings, Ltd.; Member of Council, British Non-Ferrous Metals Research Association.

Smithells, C. J., M.C., D.Sc., Director of Research, The British Aluminium Co., Ltd., Gerrards Cross; Member of Council, British Non-Ferrous Metals Research Association.

Tasker, H. S., B.A., Chairman, Goodlass Wall and Lead Industries, Ltd., London; Chairman, British Titan Products Co., Ltd., Billingham; Director, Basinghall Mining Syndicate, Ltd., London; Director, Durex Abrasives, Ltd., Birmingham; Vice-Chairman, British Non-Ferrous Metals Research Association.

NEWS AND ANNOUNCEMENTS

Honorary Treasurer

Newman, W. A. C., O.B.E., B.Sc., A.R.S.M., A.R.C.S., Chemist and Assayer, The Royal Mint, London.

Ordinary Members of Council

Allen, N. P., D.Sc., M.Met., Superintendent, Metallurgy Division, National Physical Laboratory, Teddington.

Arnott, J., Chief Metallurgist, G. and J. Weir, Ltd., Glasgow.

Bolton, E. A., M.Sc., Factory Manager, Imperial Chemical Industries, Ltd., Metals Division, Birmingham.

Campbell, D. F., M.A., A.R.S.M., Chairman, Electric Furnace Co., Ltd., Weybridge; Chairman, Electric Resistance Furnace Co., Ltd., Weybridge; Chairman, Electro-chemical Engineering Co., Ltd., Weybridge; Chairman, Davy and United Engineering Co., Ltd., Sheffield; Chairman, Davy and United Roll Foundry, Ltd., Billingham; Chairman, Duncan Stewart and Co., Ltd., Glasgow; Chairman, Metallurgical Equipment Export Co., London; Chairman, Campbell and Gifford, Ltd., Weybridge.

Cook, Maurice, D.Sc., Ph.D., Director, Metals Division, Imperial Chemical Industries, Ltd., Birmingham; Member of Council, British Non-Ferrous Metals Research Association.

Davy, C. H., Director and Chief Research and Development Engineer, Babcock and Wilcox, Ltd., London; Director, Calorizing Corporation of Great Britain, Ltd.

Herbert, T. M., M.A., Scientific Research Manager, Railway Executive, London Midland Region, London; Member of Council, British Non-Ferrous Metals Research Association.

Hignett, H. W. G., B.Sc., Superintendent, Development and Research Department Laboratory, The Mond Nickel Co., Ltd., Birmingham.

Jenkin, J. W., Ph.D., B.Sc., General Manager, Department of Development and Research, Tube Investments, Ltd., Birmingham.

Neave, D. P. C., M.A., Managing Director, Imperial Smelting Corporation, Ltd., London; Director, British Titan Products Co., Ltd.; Broken Hill Corporation, Ltd.; Capper Pass and Son, Ltd.; Consolidated Zinc Corporation, Ltd.; Frickers Metal and Chemical Co., Ltd.; Mufulira Copper Mines, Ltd.; National Smelting Co., Ltd.; Sulphide Corporation, Ltd.; Wolverhampton Metal Co., Ltd.

O'Neill, Professor H., D.Sc., M.Met., Professor of Metallurgy, University College of Swansea, University of Wales.

Powell, A. R., Research Manager, Johnson, Matthey and Co., Ltd., Wembley.

Quarrell, A. G., D.Sc., Ph.D., A.R.C.S., D.I.C., Research Manager, British Non-Ferrous Metals Research Association, London.

Thompson, Professor F. C., D.Met., M.Sc., Professor of Metallurgy, Manchester University.

NEWS AND ANNOUNCEMENTS

Ex-officio : Chairmen of Local Sections

Birmingham

Chadwick, R., M.A., Assistant Research Manager, Imperial Chemical Industries, Ltd., Metals Division, Birmingham.

London

Randall, W. F., B.Sc., A.R.S.M., Executive Director, Telegraph Construction and Maintenance Co., Ltd., London; Chairman, Temco, Ltd., Lydbrook, Glos.; Director, Transformer Steels, Ltd., London; Director, Telcon Magnetic Cores, Ltd.

Scottish

Macdonald, A. Craig, B.Sc., Chief Metallurgist, Albion Motors, Ltd., Glasgow.

Sheffield

Dale, H. G., Chief Chemist, Sheffield Smelting Co., Ltd., Sheffield.

South Wales

Hopkins, D. W., M.Sc., Lecturer in Metallurgy, University College, Swansea.

Honorary Members of Council

Representing The Admiralty :

Lister, Captain (E.) F. A., R.N.

Representing The Institution of Metallurgists :

Bailey, G. L., M.Sc., Director, British Non-Ferrous Metals Research Association, London.

Ballard, W. E., Managing Director, Metallisation, Ltd., Dudley.

Representing The Iron and Steel Institute :

McCance, Sir Andrew, D.Sc., A.R.S.M., F.R.S., Deputy Chairman and Joint Managing Director, Colvilles, Ltd., Glasgow.

Representing The War Office :

Tope, Major-General W. S., C.B., C.B.E.

Senior Vice-President

At the Annual General Meeting on 30th March 1949, it was reported that the Council had elected Mr. H. S. TASKER, B.A., as Senior Vice-President. Mr. Tasker will be the Council's nominee for election as the next President of the Institute.

NEWS AND ANNOUNCEMENTS

COMMITTEES FOR 1949-50

FINANCE AND GENERAL PURPOSES COMMITTEE.

BALL, Major C. J. P. (*Chairman*).
CAMPBELL, Mr. D. F.
DOREY, Dr. S. F.
GREENLY, Lieut.-Col. Sir John.
GRIFFITHS, Sir William.
GUETERBOCK, Col. Sir Paul.
HIGNETT, Mr. H. W. G.
JENKIN, Dr. J. W.

MURPHY, Mr. A. J.
NEAVE, Mr. D. P. C.
TASKER, Mr. H. S.

Ex-officio :

The President.
Honorary Treasurer.
Chairman, Publication Committee.

LOCAL SECTIONS COMMITTEE.

HIGNETT, Mr. H. W. G. (*Chairman*).
ALEXANDER, Dr. W. O.
BENSON, Mr. L. E.
CHASTON, Dr. J. C.
COSGRAVE, Mr. W. J. G.
GARSIDE, Dr. J. E.
PREECE, Professor A.
CHADWICK, Mr. R. (*Chairman, Birmingham Local Section*).
BUCKNALL, Mr. E. H. (*Hon. Secretary, Birmingham Local Section*).
RANDALL, Mr. W. F. (*Chairman, London Local Section*).
RHODES, Dr. E. C. (*Hon. Secretary, London Local Section*).

MACDONALD, Mr. A. CRAIG (*Chairman, Scottish Local Section*).
HAY, Mr. Matthew (*Hon. Secretary, Scottish Local Section*).
DALE, Mr. H. G. (*Chairman, Sheffield Local Section*).
MADDOCKS, Dr. W. R. (*Hon. Secretary, Sheffield Local Section*).
HOPKINS, Mr. D. W. (*Chairman, South Wales Local Section*).
SPRING, Mr. K. M. (*Hon. Secretary, South Wales Local Section*).

Ex-officio :

The President.
Honorary Treasurer.

MEDAL COMMITTEE.

PRESIDENT, The (*Chairman*).
Not more than four medallists who are, or have been, Members of Council, to be selected by the President.

Ex-officio :

Senior Vice-President.

METALLURGICAL ENGINEERING COMMITTEE.

CAMPBELL, Mr. D. F. (*Chairman*).
BALL, Major C. J. P.
NEAVE, Mr. D. P. C.
THOMAS, Mr. W. J.

Ex-officio :

The President.
Chairman, Publication Committee.

METAL PHYSICS COMMITTEE.

ALLEN, Dr. N. P. (*Chairman*).
COOK, Dr. Maurice.
HANSTOCK, Dr. R. F.
HIGNETT, Mr. H. W. G.
HUME-ROTHERY, Dr. W.
KING, Mr. R.
NABARRO, Mr. F. R. N.
OLIVER, Mr. D. A. (*representing Iron and Steel Institute and British Iron and Steel Research Association*).

OROWAN, Dr. E.
QUARRELL, Dr. A. G.
RAYNOR, Dr. G. V.
RICHARDS, Dr. T. LI.
ROTHERHAM, Mr. L.
SMITHELLS, Dr. C. J.

Ex-officio :

The President.
Chairman, Publication Committee.

NEWS AND ANNOUNCEMENTS

NOMINATIONS COMMITTEE.

PRESIDENT, The (*Chairman*).
GRIFFITHS, Sir William.

GUETERBOCK, Col. Sir Paul.

PUBLICATION COMMITTEE

O'NEILL, Professor H. (*Chairman*).

BAILEY, Mr. G. L.

COOK, Dr. Maurice.

DAVY, Mr. C. H.

FOX, Dr. F. A.

HERBERT, Mr. T. M.

HUDSON, Mr. F.

JACKSON, Mr. J. F. B.

JENKINS, Dr. Ivor.

LIDDIARD, Mr. E. A. G.

LOBLEY, Mr. A. Glynne.

PHILLIPS, Mr. H. W. L.

RAYNOR, Dr. G. V.

SMITH, Mr. Christopher.

UNDERWOOD, Dr. L. R.

Ex-officio :

The President.

Chairman, Finance and General
Purposes Committee.

Honorary Treasurer.

Chairman, Metallurgical Engi-
neering Committee.

Chairman, Metal Physics Com-
mittee.

PERSONAL NOTES

MR. F. A. ALLEN has left Bristol and is now a Director of Bronze Smelters, Ltd., Colchester Avenue, Cardiff.

MR. W. E. BALLARD has resigned the Honorary Secretaryship of the Association of Metal Sprayers, because of the heavy demands on his time in other directions. He will, however, continue as a member of the Executive Committee of the Association. The position of Honorary Secretary has been taken up by MR. R. A. PARKES of Metallisation, Ltd., Barclay's Bank Chambers, Dudley.

MR. K. C. CHOUDHURI has been elected an Associate of the Royal Institute of Chemistry.

MAJOR P. R. CLARK, R.A.O.C., is home from Japan. His private address is Casa Ploiesti, Wokingham, Berks.

DR. O. W. ELLIS has been elected to the Council of the Association of Professional Engineers of the Province of Ontario, and is continuing as a councillor of the Royal Canadian Institute for the next two sessions.

MR. K. S. GANAPATI has been appointed as an Assistant Works Manager (under training) at the Ordnance Factory, Katni, India.

PROFESSOR J. NEILL GREENWOOD was the guest at a very successful and pleasant function held in Melbourne on 17 March when his past students gave a dinner to mark the twenty-fifth anniversary of his arrival in Australia to occupy the first Chair of Metallurgy. Opportunity was taken to wish him "bon voyage" in connection with his visit to the British Isles and the Continent of Europe. As a token of esteem Professor Greenwood was presented with a gold wristlet watch, and it was announced that a Prize Fund was to be established and a Medal struck, to be known as the Greenwood Medal, which will be awarded to the student with the best results in the final Honours Examination in the Metallurgy Course of the University of Melbourne. Professor Greenwood has arrived in England, and will remain in Europe until the end of the year. He plans to attend the Paris meeting of the Institute.

NEWS AND ANNOUNCEMENTS

MR. R. KERR has resigned the position of Head of the Chemical and Metallurgical Division of Ascot Gas Water Heaters, Ltd. (Research and Development Department), to take up a post in the Research Department of the British Oxygen Co., Ltd., Morden, London, S.W.19.

MR. J. A. MATTHEWS has been elected a Member of the Institution of Mechanical Engineers.

PROFESSOR A. PORTEVIN is to be President of Classe II.—“L'évolution des matériaux” of the Premier Congrès International des Industries Aéronautiques, to be held in Paris from 9 to 18 May 1949, on the occasion of the 18e. Salon International de l'Aéronautique.

DR. CARL H. SAMANS, who was Chief of the Metallurgy Section, Research Laboratory, American Optical Co., Southbridge, Mass., has resigned to become Associate Director (Materials Division), Engineering Research Department, Standard Oil Company (Indiana). He is at present located at 910 South Michigan Ave., Chicago 5, Ill. Early this year Dr. Samans' text-book on “Engineering Metals and their Alloys” was published by the Macmillan Co., New York.

MR. J. SANDERS is no longer Chief Metallurgist to the Vulcan Boiler and General Insurance Co., Ltd., Manchester. He has commenced his own consulting practice under the business title of J.S. Industrial Laboratories, at 64 Westfield Rd., Wellingborough, Northants.

MR. H. GLYNN THOMAS has resigned his appointment as Shop Manager, Foundry and Rolling Mills, Royal Ordnance Factory, Radway Green, Crewe, and has joined the staff of Davy and United Engineering Co., Ltd., Sheffield.

MR. E. T. TURKDOGAN has been awarded the degree of M.Met. of Sheffield University, where he has been carrying out researches on slag-metal reactions.

MR. A. H. WATERFIELD has left the Armament Research Department, Ministry of Supply, to take up an appointment under the Department of Scientific and Industrial Research as Scientific Attaché at the British Embassy in Paris. During the past year he has been Secretary of the Inter-Service Metallurgical Research Council. He will not be in Paris full-time, and his address will be Department of Scientific and Industrial Research, Overseas Liaison Division, Africa House (3rd Floor), Kingsway, London, W.C.2.

LOCAL SECTIONS NEWS

SCOTTISH LOCAL SECTION

At the Annual General Meeting held at the Institution of Engineers and Shipbuilders in Scotland, 39 Elmbank Crescent, Glasgow, on 14 March 1949, the office bearers were re-elected. Two ordinary members of the Committee—Mr. E. H. A. Carlton and Mr. J. E. Chard, B.Sc., A.R.S.M.—retired, and Mr. W. A. Dunlop and Mr. E. A. Fowler, B.Sc., were elected to fill the vacancies.

NEWS AND ANNOUNCEMENTS

Before the Annual General Meeting, Mr. G. Skript, Dipl.-Ing., Managing Director of Langley Alloys, Ltd., Slough, read a paper on

Some Thoughts on Organization Economies and Good Housekeeping in Non-Ferrous Jobbing Foundries.

Mr. Skript said that the first step in management of an industrial undertaking is to lay down the sales policy. The latter determines to a large degree the lay-out and the type of administration required. Failure to co-ordinate the sales policy and the plant facilities may lead to financial failure. Administration consists of planning, organization, command, co-ordination, and control. A simple capacity planning system consisting of progress-lay-out, weekly loading sheets, and overdue list can be easily applied in jobbing foundries. Financial planning must be applied to achieve the speediest turnover of the capital.

Co-ordination safeguards the smooth running of the organization. The importance of training is often overlooked.

The function of the control is to report the deviation from plan or budget. The important control figures in a foundry are :

- (a) Raw materials,
- (b) Direct wages,
- (c) Fixed overheads,
- (d) Variable overheads.

Profit and loss can be arrived at in calculating the deviations from the standards, without going to the trouble of getting out the work-in-progress. Percentage and causes of scrap assist the foundry management. Metal loss must be kept closely controlled.

The importance of standardization cannot be sufficiently stressed.

Economies in jobbing foundries can be achieved in many directions. The first is by reduction of scrap. Metal purchases must be related to the melting and technical control facilities available. Considerable economies on metal losses, oil consumption, and the grade of metal used can be achieved when using rotary furnaces. Snap and slip flasks, use of the Durville casting method, and centrifuging of moulds may lead to reduction of cost if correctly applied. A suitable core-sand mixture saves bedding out cores or eliminates the driers. A converted riveter is a useful tool for the knock-out. Table cutting-off machines are very fast and inexpensive to operate.

A good management of air system pays dividends. Floor inspection at various stages reduces unproductive wages bill.

Mr. Skript said that not enough basic research is carried out in the foundry ; still less is done in the direction of applied research. Foundrymen must have an easily digestible recipe to operate with.

The author advocated technical buying. Minimum and maximum stocks fixed in advance check the inflation of stocks and safeguard the continuity of supplies.

The amount of floor to floor handling can be reduced by improved transport facilities. A good crane, a stretch of conveyor here and there, and mono rail for metal distribution reduces man-power and improves efficiency.

NEWS AND ANNOUNCEMENTS

SOUTH WALES LOCAL SECTION

The meeting arranged for 26 April and postponed will now be held on Tuesday, 31 May, when Mr. R. H. Brooker, of Messrs. Johnson, Matthey and Co., Ltd., will read a paper on "Brazing" at University College, Singleton Park, Swansea, at 6.30 p.m. The paper will be illustrated by lantern slides and a film.

OTHER NEWS

APPOINTMENT OF SCIENTIFIC LIAISON OFFICER IN FRANCE

In agreement with the Foreign Office, the Department of Scientific and Industrial Research has appointed Mr. A. H. Waterfield, a Principal Scientific Officer, formerly of the Ministry of Supply, for scientific liaison duties in France, with the rank of Attaché at H.M. Embassy in Paris.

Mr. Waterfield, who is a metallurgist with special experience in the light alloy field (and is a member of the Institute of Metals), was formerly on the Headquarters staff of the Ministry of Aircraft Production, later the Ministry of Supply, and during the last year has been Secretary of the Inter-Service Metallurgical Research Council. In 1946-47 he was attached to the U.K. Scientific Mission in Washington for metallurgical liaison duties.

As Scientific Attaché in Paris his responsibilities will include helping U.K. Departments on various matters of fundamental and applied science and technology in France, especially in the fields of interest to D.S.I.R. and the industrial research associations.

ALUMINIUM DEVELOPMENT ASSOCIATION

Mr. Kenneth Hall, Managing Director of the Northern Aluminium Co., Ltd., has been elected President of the Association for the year, and Mr. H. E. Jackson, Vice-President.

FILMS ABOUT METALS

A new film catalogue, "Films about Metals", has been published for the Scientific Film Association by Current Affairs, Ltd., 19 Charing Cross Road, London, W.C.2, price 3s. 6d. (3s. 8d., post free).

This catalogue, prepared in conjunction with the Joint Committee on Metallurgical Education, is the first of a series on specialized subjects which will ultimately replace the "Catalogue of Films of General Scientific Interest" (The Scientific Film Association, price 5s.). Titles of about 200 films are given, together with running time, gauge, and distributor. Wherever possible, a brief synopsis of content is given and a number of films have been appraised for audience suitability by the expert viewing panels of the S.F.A. A wide field of subjects is covered from the basic metallurgical processes to the utilization of metals in bridge construction and the manufacture of car bodies.

NEWS AND ANNOUNCEMENTS

INSTITUTION OF METALLURGISTS

The following were elected to membership on 18 January 1949 :

As Fellows

ADCOCK, Frank, M.B.E., D.Sc. (Broken Hill Proprietary Co., Ltd.).
ATKINSON, John Barnes, B.Sc. (Hercules Cycle and Motor Co., Ltd.).
BERRY, Brian Exley, M.A. (Murex, Ltd.).
EDWARDS, Alun, B.Sc., Ph.D. (James Neill and Co. (Sheffield), Ltd.).
HARRIES, David Chapman, B.Met. (English Steel Corporation, Ltd.).
HOWARD, Edward John Lees (Mather and Platt, Ltd.).
REES, Rees William, B.Sc. (Murex, Ltd.).

As Associates

ATKINS, Clifford, B.Sc., Ph.D. (Morgan Crucible Co., Ltd.).
BUSBY, Arthur Donald, B.Sc. (Mond Nickel Co., Ltd.).
BUTTLER, Maurice William, A.Met. (B.I.S.R.A.).
HALL, Douglas Wilson, B.Sc. (Rolls-Royce, Ltd.).
HARRIS, Charles (Geo. Salter and Co., Ltd.).
HESSELBERGER, Wilhelm Max Ernst, Ph.D. (Elkington and Co., Ltd.).
JOHNSTON, Dominick, M.Sc. (University of Leeds).
KEEBLE, Hubert William (William Mills, Ltd.).
KIDMAN, Lawrence, A.Met. (English Steel Corporation, Ltd.).
MISRA, Ram Anugrah Prasad (Indian Wild-Barfield Co., Ltd.).
MURPHY, Philip Conway, B.Sc. (Aluminium Laboratories, Ltd.).
ROSS, William Laurance (Bruntons (Musselburgh), Ltd.).
SANDERS, Leslie William (Lake and Elliot, Ltd.).
SWINYARD, Gordon, B.Sc. (J. Stone and Co., Ltd.).
WRIGHT, Wilfred, A.Met. (Permanent Magnet Association).

As Associates from Grade of Licentiate

HOOPER, Brian (Coventry Gauge and Tool Co., Ltd.).
SHARP, Kenneth Copley (Dorman, Long and Co., Ltd.).
STEMMAN, George Thomas, B.Sc., A.C.T.C. (I.C.I., Ltd.).

As Licentiates

BASU, Anil Chandra, B.Sc. (Metal and Steel Factory, India).
BOLTON, William Leslie (West Yorkshire Foundries, Ltd.).
BOYS, Sydney Joseph Henry (Rubery Owen and Co., Ltd.).
BROWN, Anthony Reginald George, M.Sc. (B.I.S.R.A.).
DIXON, Geoffrey Walter (Wm. Jessop and Sons, Ltd.).
DUNGER, Colin (Dorman, Long and Co., Ltd.).
FODDY, William, A.M.C.T. (de Havilland Aircraft Co., Ltd.).
LANE, Derek, B.Sc. (Newton, Chambers and Co., Ltd.).
LLOYD, Rex (Castings, Ltd.).
MCCLURE, Andrew Hay (Fairey Aviation Co., Ltd.).
MEYER, Ernest Frederick (Briton Ferry Steel Co., Ltd.).
MIDDLETON, Wilfred Francis (Humber, Ltd.).
MORGAN, Clifford James (Steel Company of Wales, Ltd.).
MORTIMER, Oscar Basil (March Bros. and Co., Ltd.).
PICKERING, Frederick Brian, A.Met. (United Steel Companies, Ltd.).
POLLOCK, Wallace Albert Charles (Guest, Keen and Nettlefolds, Ltd.).
RICHARDS, Glanville (National Smelting Co., Ltd.).
SWALES, George Leonard (Dorman, Long and Co., Ltd.).
TOMLINSON, Alfred, A.Met. (Brown-Firth Research Laboratories).
WALSH, Marjorie Elaine (English Electric Co., Ltd.).
WINFIELD, Gerald (Round Oak Steel Works, Ltd.).

NEWS AND ANNOUNCEMENTS

DIARY FOR JUNE

WEDNESDAY, 8 JUNE

Geological Society of London.—Ordinary Evening Meeting.
(Burlington House, Piccadilly, W.1, at 5 p.m.)

TUESDAY, 14 JUNE

Electrodepositors' Technical Society, Midlands Centre and Sheffield and North-East Centre.—Joint meeting. T. Parry: "Plating and Finishing of Cycle Components". (Victoria Hotel, Morsfield Rd., Nottingham, at 6.30 p.m.)

TUESDAY, 14, TO FRIDAY, 17 JUNE

Institute of British Foundrymen.—Annual Conference at Cheltenham Spa.

MONDAY, 20 JUNE

Electrodepositors' Technical Society.—V. Evans, M.Sc.: "Tank Linings and Insulating Materials". (Northampton Polytechnic, St. John St., Clerkenwell, London, E.C.1, at 5.30 p.m.)

WEDNESDAY, 29 JUNE

Geological Society of London.—Ordinary Evening Meeting.
(Burlington House, Piccadilly, London, W.1, at 5 p.m.)

APPOINTMENT REQUIRED

ELECTRICAL ENGINEER requires responsible executive or technical sales position, 14 years' practical experience physical metallurgy and application all classes metals to light engineering. Some business experience. Box No. 262, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

APPOINTMENTS VACANT

NON-FERROUS INGOT MANUFACTURERS, old-established, are to make an appointment of a SENIOR SALES REPRESENTATIVE with extensive trade experience and connections. Excellent opportunity. Life and pension scheme. Write, with full particulars, to Box No. 265, Institute of Metals, 4 Grosvenor Gardens, London S.W.1.

UNIVERSITY OF BIRMINGHAM. CHAIR OF INDUSTRIAL METALLURGY. Applications are invited for the Chair of Industrial Metallurgy at a salary at the rate of £1750 per annum, duties to commence 1 October 1949.

Candidates must have had considerable industrial and research experience.

Further particulars may be obtained from the undersigned, to whom applications (five copies) with names of three referees (no testimonials) should be sent by 31 May 1949.

C. G. BURTON, Secretary.

The University,
Birmingham 3.
April 1949.

UNIVERSITY OF NOTTINGHAM. DEPARTMENT OF ENGINEERING. Applications are invited for the appointment of a Lecturer or Assistant Lecturer in Metallurgy. Candidates should possess a good University degree and have practical and/or research experience. Salary scales: Lecturer £550-£900 per annum; Assistant Lecturer £450-£550 per annum. The grade of the appointment and the initial salary will be fixed according to the qualifications and experience of the selected candidate, who will be required to take up his duties on 1 October 1949.

Conditions of appointment and form of application, which should be returned as soon as possible, may be obtained from the undersigned.

H. PICKBOURNE, Registrar.

THE STRUCTURE OF METALS AND ALLOYS

By WILLIAM HUME-ROTHERY, M.A., D.SC., F.R.S.

Fifth (revised) Reprint

Cloth. Pp. 137 with 61 Figures

Price : 4s. 6d., post free (members 2s. 3d., post free)

CONTENTS : THE ELECTRONIC BACKGROUND TO METALLURGY : The Structure of the Atom ; The Structure of the Molecule ; The Structure of the Crystal. THE CRYSTAL STRUCTURE OF THE ELEMENTS. THE ATOMIC RADII OF THE ELEMENTS. PRIMARY METALLIC SOLID SOLUTIONS : The Conception of Atomic Size Factor ; The Electro-negative Valency Effects ; The Form of Liquidus Curves ; The Form of Solidus Curves ; The Form of Primary Solid Solubility Curves ; Superlattice Structures. INTERMEDIATE PHASES IN ALLOY SYSTEMS : Normal Valency Compounds : Electron Compounds and the Electron Concentration Rule ; Interstitial and Other Structures Determined by the Size Factor. IMPERFECTIONS IN CRYSTALS AND DEVIATIONS FROM THE IDEAL LATTICE. INDEX.

Press Opinions of Previous Editions

Journal of the Franklin Institute : “. . . one is impressed with the masterly co-ordination of the text with the illustrations, their arrangement and structure. The book can benefit a large number of scientific men of widely diversified interests.”

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Chemistry and Industry : “We consider the book an admirable one for its purpose.”

THE INSTITUTE OF METALS
4 Grosvenor Gardens, London, S.W.1.

NOTICE TO AUTHORS OF PAPERS

1. **Papers will be considered for publication from non-members as well as from members of the Institute.** They are accepted for publication in the *Journal*, and not necessarily for presentation at any meeting of the Institute, and should be addressed to The Editor of Publications, The Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.
2. **Papers suitable for publication may be classified as :**
 - (a) Papers recording the results of original research ;
 - (b) First-class reviews of, or accounts of, progress in a particular field ;
 - (c) Papers descriptive of works methods, or recent developments in metallurgical plant and practice.
3. **Manuscripts and illustrations** should be submitted in duplicate. MSS. must be typewritten (*double-line spacing*) on one side of the paper only, and authors are required to sign a declaration that neither the paper nor a substantial part thereof has been published elsewhere. MSS. not accepted are normally returned within 3 months of receipt.
4. **Synopsis.** Every paper must have a synopsis which, in the case of results of research, should state its objects, the ground covered, and the nature of the results. The synopsis will appear at the beginning of the paper, and should be in a form suitable for use by abstracting organizations.
5. **References** must be collected at the end of the paper, and *each* must have a number. Initials of authors must be given, and the Institute's official abbreviations for periodical titles (as used in *Met. Abs.*) must be used where known. References must be set out in the style :

W. Rosenhain, *J. Inst. Metals*, 1923, **30**, 3 (i.e. year, volume, page).
6. **Illustrations.** Each illustration must have a number and description ; only one set of numbers must be used in one paper. The set of *line figures* sent for reproduction must be drawn in Indian ink on smooth white Bristol board, good-quality drawing paper, co-ordinate paper, or tracing cloth, which are preferred in the order given. Co-ordinate paper, if used, must be blue-lined with the co-ordinates to be reproduced *finely* drawn in Indian ink. All lettering and numerals, &c., should preferably be in *pencil*. Figures should be drawn approximately twice the size intended for reproduction. *Photographs* must be restricted in number, owing to the expense of reproduction, and trimmed to the smallest possible of the following sizes, consistent with adequate representation of the subject : 3 in. deep by 4 in. wide (two photomicrographs to a plate) ; 3 in. deep by 2½ in. wide (four to a plate) ; 2 in. deep by 2½ in. wide (six to a plate). Magnifications of photomicrographs must be given in each case. Photographs for reproduction should be loose, not pasted down (and not fastened together with a clip, which damages them), and the figure number should be written on the back of each. Legends should be given to photomicrographs, but lengthy descriptions should be avoided owing to the very limited space available on the plates. Illustrations that are not *essential* to the appreciation of the paper should not be included. Only in exceptional cases will illustrations be reproduced if already printed and readily available elsewhere.
7. **Tables or Diagrams.** Results of experiments, &c., may be given in the form of tables or figures, *but* (unless there are exceptional reasons) *not both*.
8. **Overseas Authors.** Authors resident in countries distant from Great Britain are requested to name, if possible, agents in Britain to whom may be referred matters concerning their papers, including proofs for correction. Translations from foreign languages should preferably be accompanied by a copy of the MS. in the language of the author.
9. **Offprints.** Individual authors are presented with 50, two authors with 70, and three with 90, offprints of their papers (in cover) from the *Journal*. Limited numbers of additional offprints can be supplied at the author's expense if ordered before proofs are passed for press. (Orders should preferably be placed when submitting the MSS.)
10. **Prizes for Papers.** Each year the following awards are made for papers published in the *Journal* : (a) Capper Pass Award for papers on processes or plant used in the fabrication of non-ferrous metals ; (b) W. H. A. Robertson Medal, and Premium for papers on engineering aspects of non-ferrous metallurgy.

THE INSTITUTE OF METALS

President :

Sir ARTHUR SMOUT, J.P.

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Major R. E. MOORE

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INSTITUTE NEWS AND ANNOUNCEMENTS

NEW MEMBERS OF COUNCIL

In accordance with Article 28, the Council has appointed Dr. G. V. RAYNOR, M.A., I.C.I. Research Fellow in Theoretical Metallurgy at Birmingham University, to be an Ordinary Member of Council to fill a vacancy caused by the resignation of Professor L. AITCHISON, D.Met., M.Sc. Dr. Raynor will submit himself for re-election at the next Annual General Meeting, in accordance with the Articles.

Mr. H. G. DALE, Chief Chemist, Sheffield Smelting Company, Ltd., Sheffield, having been elected Chairman of the Sheffield Local Section for the year 1949-50, has taken his seat on the Council in accordance with Article 19 (f).

HONORARY MEMBERS

The Council has elected the following Members as Honorary Members, in recognition of their distinguished services to non-ferrous metallurgy :

Professor LESLIE AITCHISON, D.Met., M.Sc., Professor of Industrial Metallurgy, Birmingham University.

Sir CLIVE LATHAM BAILLIEU, K.B.E., C.M.G., M.A., Chairman, The Central Mining and Investment Corporation, Ltd. ; Director, Consolidated Zinc Corporation, Ltd., &c.

FELLOWS

The Council has elected the following members as Fellows, in recognition of their eminent services to the Institute :

Colonel Sir PAUL GUETERBOCK, K.C.B., D.S.O., M.C., T.D., D.L., J.P., M.A., A.D.C., Past-President ; Managing Director, Capper Pass and Son, Ltd. ; Chairman, The British Smelters' Association ; Vice-Chairman, British Non-Ferrous Metals Research Association.

Mr. W. H. A. ROBERTSON, Original Member ; Managing Director, W. H. A. Robertson and Company, Ltd., Bedford.

HONORARY CORRESPONDING MEMBERS TO THE COUNCIL

Professor R. F. MEHL, Ph.D., Eng.D., Sc.D., Director of the Metals Research Laboratory and Head of the Department of Metallurgical Engineering, Carnegie Institute of Technology,

NEWS AND ANNOUNCEMENTS

Pittsburgh, Pa., and Dr. R. A. WILKINS, Vice-President of Revere Copper and Brass, Inc., Rome, N.Y., have been elected additional Honorary Corresponding Members to the Council for the United States of America.

ELECTION OF ORDINARY MEMBERS, ASSOCIATE MEMBER, AND STUDENT MEMBERS

The following 16 Ordinary Members, 1 Associate Member, and 12 Student Members were elected on 18 May 1949 :

As Ordinary Members

- ÅKERLUND, Jarl Tore, Metallurgist, A/B W. Dan Bergman, Södertälje, Sweden.
- ALEXANDER, Kenneth, Chief Metallurgist, Stokes and Sons, Pty., Ltd., Brunswick, Australia.
- BIDGOOD, Ivor Michael, M.Sc., Research Assistant, Ministry of Supply, University College, Cardiff.
- BINKS, Cornelius John, Foundry Manager, C. Binks, Endive Place, Rhodeswell Road, London, E.14.
- BRIAN, James Gilbert, Assistant Works Manager, Imperial Chemical Industries, Ltd., Metals Division, Broughton Copper Works, Manchester.
- BROWN, Donald William, B.Sc., Metallurgist, The Morgan Crucible Company, Ltd., Battersea Church Road, London, S.W.11.
- CORRÊA DA SILVA, Luiz C., Research Engineer, Institute for Technological Research, Sao Paulo, Brazil.
- DEERING, Ernest Charles, B.Sc., Director, Johnson, Matthey and Company, Ltd., Hatton Garden, London, E.C.1.
- DEGOWIN, Watson R., B.M.E., Metallurgist, The Detroit Testing Laboratory, Detroit 26, Mich., U.S.A.
- GALLWEY, William Broke Hoppner, Managing Director, British Acheson Electrodes, Ltd., Wincobank, Sheffield.
- HALE, Edgar Wilfred, Manager, The Morgan Crucible Company, Ltd., Battersea Church Road, London, S.W.11.
- KOWALCZYK, Joseph Tomath, Dipl.Ing., Technical Adviser to the General Direction de Fabricaciones Militares, Buenos Aires, Argentina.
- LANCHBERY, William John, Mechanical Engineer, British Phosphate Commission, Christmas Island, Indian Ocean, via Fremantle, Western Australia.
- PATRICK, Frederick James, City Librarian, Reference Library, Birmingham 1.
- ROBSON, Harry, Assistant Metallurgist, D. Napier and Sons, Ltd., Acton, London, W.3.
- WHITE, Dennis George, B.Sc., A.R.S.M., Metallurgist, Thos. Bolton and Sons, Ltd., Widnes, Lancashire.

As Associate Member

- SPROULL, Theodore William, B.S., M.S., Metallurgist, Babcock and Wilcox Company, Barberton, O., U.S.A.

As Student Members

- FRENCH, Edward Llewelyn, B.A., Assistant Metallurgist, Joseph Lucas, Ltd., Shaftmoor Lane, Birmingham 28.

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- GANGULI, Ramapati, Student of Metallurgy, College of Mining and Metallurgy, Benares Hindu University, Benares, India.
- HALL, Eric Ogilvie, M.Sc., Physicist, Cavendish Laboratory, Cambridge.
- HASLAM, Norman, B.A., Student of Metallurgy, Cambridge University.
- LEFEBVRE, George A., Student of Metallurgy, Faculté Polytechnique de Mons, Belgium.
- LOEB, Roger, Licence en Droit et Econ. Sci., Metallurgist, Les Alliages d'Etain et Dérivés, 204 Rue Saint Maur, Paris, France.
- LYNCH, Brian Maurice, Student, Melbourne University, Melbourne, Australia.
- McKENNY, Basil John, Technical Assistant, John Dale, Ltd., Ridgeview Road, London Colney, Herts.
- MAHENDRA, Balram Kumar, Student of Metallurgy, College of Mining and Metallurgy, Benares Hindu University, Benares, India.
- STORER, Roy Alan, Assistant Metallurgist, Joseph Lucas, Ltd., Shaftmoor Lane, Birmingham 11.
- THOMSON, David Charles, Metallurgist, H. E. Carde and Company, Ltd., Holyhead Road, Wednesbury, Staffordshire.
- WITT, Robert H., Metallurgist, Sperry Gyroscope Company, Great Neck, Long Island, N.Y., U.S.A.

PERSONALITIES

DR. LENO MATTEOLI

Dr. Leno Matteoli, who has been elected Honorary Corresponding Member to the Council for Italy, was born at Leghorn on 11 September 1905, and graduated in chemistry in 1927 from the Faculty of Science of the University of Pisa.

After holding the appointment of Laboratory Chemist at the Fornaci di Barga works of the Società Metallurgica Italiana, he became Chief of the Chemical and Metallographical Laboratory for the control of working methods and of finished products. In 1931 he was awarded the Ernesto Breda Scholarship, and took a year's course of study and metallurgical and metallographic research at the Istituto Scientifico Tecnico Ernesto Breda. On rejoining the staff of the Società Metallurgica Italiana in 1933, he was entrusted with the task of forming a Central Research Laboratory, and was appointed its Chief.

In 1935 Dr. Matteoli was en-



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gaged by the Società Italiana Ernesto Breda for duty at the Istituto Scientifico Tecnico Ernesto Breda, of which he became Vice-Director in 1945. This Institute is the largest unit in Italy for study and research in the fields of ferrous and non-ferrous metallurgy and has more than 100 researchers and technicians on its staff. From 1940 to 1945 Dr. Matteoli was Lecturer in Metallurgy and Metallography at Bologna University.

Dr. Matteoli is the author or joint author of 34 scientific papers, lectures, and articles on many subjects relating to steels, copper, brasses, and bronzes, most of which have appeared in Italian publications. He was elected a member of the Institute of Metals in 1939, is a member of the Associazione Italiana di Metallurgia, various Italian standardizing committees for metals (he is Chairman of the Heat-Treating Sub-Committee), the Iron and Steel Institute, and the American Society for Metals. He is also a member of the Board of Directors of the Italian Welding Institute.

COPIES OF JOURNAL WANTED

The Secretary will be pleased to receive copies of the May 1946 *Journal*, if any can be spared by members.

PERSONAL NOTES

PROFESSOR GEORGES CHAUDRON was inducted into the Chair of Applied Chemistry at the Sorbonne, Paris, on Monday, 2 May. Representatives from the Académie des Sciences, of the Navy, Army, Air Force, &c., most of the professors from the University and the Colleges, well known metallographers and metallurgists, all Professor Chaudron's present pupils and a large number of old pupils, some of whom had come from very long distances, gathered in the large hall of the Faculté des Sciences to hear his inaugural lecture on "Teaching and Research in the Metallurgical Field".

Professor Chaudron's long experience in this field, gained in the training of numerous students and in the pursuit of his own researches, which have placed him among the acknowledged leaders of the French metallographic school, formed the basis of a vivid and interesting lecture, which was warmly received by his audience.

MR. J. W. CHRISTION has been awarded the degree of D.Phil. of Oxford University.

MAJOR H. B. DESHPANDE has been elected a Corporate Member of the Chartered Institution of Engineers, India.

MR. D. R. GODDARD has left the Physics Department of the University of Birmingham, having obtained the degree of M.Sc., and has taken up the appointment of Technical Manager with British American Research, Ltd., Block E2, Hillington, Glasgow, S.W.2.

MR. A. T. GREEN, O.B.E., Director of Research of the British Ceramic Research Association, has been awarded the degree of D.Sc. *honoris causa* by Leeds University, in recognition of his services to the science of ceramics.

NEWS AND ANNOUNCEMENTS

DR. V. J. D. HILL, Manager of Thermal Welding Products, Ltd., of South Africa, has been invited to represent South Africa on two Technical Committees of the International Institute of Welding, viz. the Brittle Fracture Committee and the Weldability Committee.

MR. P. W. HYDE has resigned his post at the Research Laboratories of the General Electric Co., Ltd., Wembley, to take up the appointment of Metallurgical Engineer at the Westlands Aircraft Co., Ltd., Yeovil.

MR. H. J. KOZLOWSKI has been awarded the degree of M.Sc. of Birmingham University.

MISS K. LITTLE has left British Nylon Spinners, Coventry, and is now working for the Medical Research Council at Harwell.

MR. F. M. LOWE was recently appointed Chemist-in-Charge at the Royal Ordnance Factory, Nottingham.

MR. R. W. REES has left the position of Departmental Manager of the Powder Metallurgy Division of Murex, Ltd., to become Production Manager of the newly-formed Hard Metals, Ltd., Springs, Transvaal, South Africa.

SIR ARTHUR SMOUT has had conferred on him the Honorary Associateship of the Birmingham Central Technical College.

MR. A. STUDDARD has left Magnesium Elektron, Ltd., and is now an Assistant Metallurgist at Philips Blackburn Works, Blackburn, Lancs.

CAPTAIN HUGH VIVIAN has retired from the Chairmanship of Beyer, Peacock and Co., Ltd.

NEWS OF LOCAL SECTIONS AND ASSOCIATED SOCIETIES

LONDON LOCAL SECTION

The Annual General Meeting of the London Local Section was held at 4 Grosvenor Gardens, London, S.W.1, on Thursday, 7 April 1949, at 6 p.m., Mr. W. F. Randall, B.Sc., A.R.S.M., occupying the Chair. After the business meeting, Dr. Ivor Jenkins opened a discussion on

Controlled Atmospheres

He said that controlled-atmosphere processes require the application of the fundamental principles of physical chemistry to reactions which take place when a metal is heated in a mixture of gases. These reactions may include those between the metal, or one of its alloying elements, and gases in the furnace atmosphere; or those between the gases themselves, the metal only being involved if it serves as a catalyst for the reaction. In this general field are included oxidation-reduction reactions; sulphide staining; decarburization; cementation; thermal, or gas, etching, &c. Reliable chemical equilibrium data are now available for most, if not all, of the reactions likely to be met with in industrial heat-treating processes.

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The significance of reaction velocity in controlled-atmosphere processes cannot be over-emphasized. Thermodynamics supply the equilibrium data for a reaction; the reaction velocity indicates to what extent it will proceed in a given time, and whether, from this point of view, the reaction is of importance or not. In any heat-treatment process, the number of factors which may influence the reaction velocity are so many that it is difficult to formulate for it a simple mathematical relationship. Qualitative data are being collected, however, and, although somewhat empirical, are none the less useful.

Controlled atmospheres may be generated from ammonia, charcoal, or hydrocarbons such as town's gas, propane, &c. Atmospheres are thus available ranging from simple hydrogen-nitrogen mixtures to the more complex types including, in addition, carbon oxides, methane, sulphur gases, &c. These latter atmospheres can be processed for the removal of one or more constituents such as water vapour, carbon dioxide, or sulphur.

There is still considerable scope for further study in this field, particularly on the effect of surface reactions on the activity of metal surfaces. The hardening of alloys by internal oxidation and the coating of base metals by decomposition of metal halides are fields for continued investigation, as also is the behaviour of heat-resisting furnace parts in complex controlled atmospheres. Novel developments in furnace design to meet specific requirements will undoubtedly continue, while the trend towards standardization of atmospheres will probably reduce the wide range at present available to one or two having a broad, but effective, application.

COMMITTEES FOR THE SESSION 1949-50

The following Committees have been elected for the session 1949-50:

Birmingham

Chairman : R. Chadwick, M.A., F.R.I.C., F.I.M.

Vice-Chairman : B. Thomas, F.Inst.P.

Honorary Secretary : E. H. Bucknall, M.Sc., F.I.M.

Honorary Treasurer and Representative on Co-ordinating Committee of the Midland Metallurgical Societies : H. H. Symonds, A.I.M.

Past-Chairmen : N. P. Allen, D.Sc., M.Met., F.I.M.; E. A. Bolton, M.Sc., F.I.M.; and W. L. Govier, F.I.M.

Ordinary Members : H. W. G. Hignett, B.Sc., A.R.I.C., F.I.M.; J. O. Hitchcock, B.Sc., F.I.M.; J. W. Jenkin, Ph.D., F.I.M.; A. W. Matthews, L.I.M.; A. J. Rickard, B.Sc.; E. A. Smith (representing Associates); and F. E. Stokeld, F.I.M.

London

Chairman : W. F. Randall, B.Sc., A.R.S.M., M.I.E.E., F.I.M.

Vice-Chairman : E. A. G. Liddiard, M.A., F.I.M.

Honorary Secretary : E. C. Rhodes, Ph.D., B.Sc., A.R.I.C.

Honorary Treasurer : J. D. Grogan, B.A.

Ordinary Members : J. C. Chaston, Ph.D., B.Sc., A.R.S.M.; R. G. Harper, M.Sc.; E. C. J. Marsh, B.Sc., A.R.I.C.; W. K. B. Marshall, B.Sc., A.I.M.; E. G. V. Newman, B.Sc., A.R.S.M., A.I.M.; and C. E. Ransley, Ph.D., M.Sc., F.I.M.

NEWS AND ANNOUNCEMENTS

ex officio :

Past-Chairmen : G. L. Bailey, M.Sc., F.I.M.; A. J. Murphy, M.Sc., F.I.M.; and J. H. Watson, M.B.E., M.C., B.Sc., Ph.D., A.R.S.M., F.I.M.

Scottish

Chairman : A. Craig Macdonald, B.Sc., M.I.Mech.E., F.R.I.C., F.I.M.

Vice-Chairman : John Arnott, F.R.I.C., F.I.M.

Honorary Secretary : Matthew Hay.

Honorary Treasurer : N. J. MacLeod.

Ordinary Members : H. R. Beauchamp; Harold Bull; W. A. Dunlop; E. G. Flack; E. A. Fowler, B.Sc., A.R.T.C.; J. Glover (representing Associates); Geo. MacDonald, O.B.E., B.Sc.; and D. McSwein (representing Associates).

ex officio :

Past-Chairmen : Professor G. Wesley Austin, O.B.E., M.A., M.Sc., F.I.M.; and A. B. Graham.

Sheffield

Chairman : H. G. Dale, F.R.I.C.

Vice-Chairman : M. M. Hallett, M.Sc., F.I.M.

Joint Honorary Secretaries : A. J. MacDougall, M.Met., F.I.M.; and W. R. Maddocks, Ph.D., B.Sc.

Honorary Treasurer : W. R. Maddocks, Ph.D., B.Sc.

Past-Chairman : Major F. Orme, T.D., M.Met., A.R.I.C., F.I.M.

Ordinary Members : P. R. Beeley, B.Met., A.I.M.; T. B. Bowker; A. Edwards, Ph.D., B.Sc., F.I.M.; H. P. Gadsby, Assoc. Met.; J. F. B. Jackson, B.Sc., A.R.I.C.; Frank Mason, M.I.E.E.; C. Sykes, D.Sc., Ph.D., F.Inst.P., F.R.S.

South Wales

Chairman : D. W. Hopkins, M.Sc., A.I.M.

Honorary Secretary : K. M. Spring, A.I.M.

Honorary Treasurer : W. H. Grenfell.

Past-Chairmen : Harry Davies, F.I.M.; I. S. Grant, A.I.M.M., F.I.M.; Roosevelt Griffiths, M.Sc., F.I.M.

Ordinary Members : E. A. Hontoir, B.Sc., A.I.M.; C. J. C. Lewis (representing Associates); J. H. M. A. Reid, B.Sc. (representing Student Members); L. W. T. Webb; and G. H. H. Williams, B.Sc. (representing Student Members).

Leeds Metallurgical Society

President : J. Wilkinson.

Past-Presidents : W. R. Berry, M.Sc., A.R.I.C., F.I.M.; Major G. H. Kitson; and Professor A. Preece, M.Sc., F.I.M.

Vice-Presidents : W. J. G. Cosgrave, B.Sc., A.I.M.; and G. W. Green, O.B.E., F.I.M.

Honorary Secretary : F. Lindars.

Honorary Treasurer : D. E. Catton.

Ordinary Members : R. Goodacre, B.Sc., Ph.D.; Dr. R. Hargreaves, M.A.; A. Lenton, A.M.I.Mech.E.; F. K. Neath, B.Sc.; H. D. Ward; P. Woodhead.

OTHER NEWS

FOURTH EMPIRE MINING CONGRESS

Sixteen countries of the British Commonwealth, including Canada, Australia, New Zealand, South Africa, and India, and 11 other countries, including the U.S.A., are to be represented at the Fourth Empire Mining and Metallurgical Congress to be held in Great Britain from 9 to 23 July this year. About 600 delegates and members will attend the Congress in London and 300 will take part in the technical sessions in Oxford and visit the various excursion centres in England, Scotland, and Wales.

The Congress, which is convened by the Empire Council of Mining and Metallurgical Institutions, was first held with support of the Governments of the Empire at the Empire Exhibition, Wembley, in 1924, and was so successful that it was decided that it should be triennial. The Second Congress was in Canada in 1927 and the Third in South Africa in 1930. Economic conditions led to the abandonment of the projected Fourth Congress in Australia in 1933 and it was not then possible to organize it until after the war.

The chief object of the Congress is to enable scientists, engineers, and others concerned in the mining and metallurgical industries to discuss technical progress and problems, including the development of the mineral resources of the Commonwealth. The Honorary President is the Prime Minister, Mr. C. R. Attlee, and the President is Sir Henry Tizard, Chairman of the British Government's Advisory Council on Scientific Policy.

Forty papers will be presented and discussed at sessions in the debating hall of the Oxford Union from 13 to 16 July, the subjects covering mineral resources, modern methods of prospecting (including aerial survey), the effects of heat and humidity on workers in deep mines, petroleum production, coal mining, mineral dressing and metallurgical research, development, and fabrication.

"The Metallurgical and Mining Aspects of Atomic Energy" is the subject of an evening lecture in Oxford by Sir John Cockcroft, Director of Research on Atomic Energy, Ministry of Supply; Dr. Charles Camsell, Canada, is to lecture on "Miners as Pioneers"; and Dr. W. Hume-Rothery, Lecturer in Metallurgical Chemistry, University of Oxford, on "The General Theory of Metals and Alloys".

After the Oxford sessions, the delegates and members will split into four parties for visits to industries and places of interest centred on Cardiff, Cornwall, Edinburgh, and Newcastle-upon-Tyne.

Countries to be represented by delegates or by individual members at the Congress are Great Britain, Canada, Australia, New Zealand, South Africa, India, British Guiana, Sierra Leone, Gold Coast, Nigeria, Kenya, Uganda, Tanganyika, Northern Rhodesia, Southern Rhodesia, Egypt, Iraq, Malaya, Belgium, Holland, Italy, Norway, Spain, Sweden, Switzerland, Chile, and the U.S.A.

RADIUM AND RADON FOR INDUSTRIAL RADIOGRAPHY

The Ministry of Supply wishes to make known to industry that the Government-owned Radiochemical Centre at Amersham,

NEWS AND ANNOUNCEMENTS

Bucks., can now accept orders for radium and radon as sources of gamma rays for use in industrial radiography.

Demonstrations of gamma radiography can be seen, without charge, by appointment with either (1) the Superintendent of Radiology Research, Ministry of Supply, Armament Research Establishment, Woolwich, London, S.E.18 (telephone : Woolwich 2044, ext. 1929), or (2) the Director, the National Physical Laboratory, Teddington, Middlesex (telephone : Molesey 1380).

INDUSTRIAL FINISHES EXHIBITION : POSTPONEMENT TO 1950

After full consultation between members of the Honorary Council, the Advisory Technical Committee, and leading exhibitors, it has been decided to postpone the first British Industrial Finishes Exhibition at Earl's Court until September 1950. It has been found that the time which had been allowed for the preparation of the exhibition was not quite sufficient, either for exhibitors themselves, or for the Advisory Technical Committee charged with the preparation of an objective Central Technical Exhibit which would serve to provide up-to-the-minute information to manufacturers in every part of the United Kingdom. In these circumstances it was felt that it would be unwise to proceed with the exhibition in September of this year.

It is proposed to run concurrently with the 1950 Exhibition a scientific congress on Industrial Finishing, to which technicians and executives in British industry will be invited and at which the foremost experts on the subject will speak. It is also proposed to issue a handbook in connection with the exhibition which will serve as an up-to-date guide to manufacturers. Particulars of the exhibition may be obtained from the Organizing Secretary, 26 Old Brompton Road, London, S.W.7.

SIR GEORGE BEILBY MEMORIAL FUND

The Administrators of the Sir George Beilby Memorial Fund, representing the Institute of Metals, the Royal Institute of Chemistry, and the Society of Chemical Industry, have decided to make an award from the Fund for 1948 of one hundred and fifty guineas to Arthur Stuart Clark Lawrence, Ph.D., Sc.D., F.Inst.Pet., F.R.I.C., in recognition of his research work in colloid science with special reference to lubrication and fuel oils.

Awards from the Fund are made to British investigators in science as a mark of appreciation of distinguished work, particularly in such fields as fuel economy, chemical engineering, and metallurgy in which Sir George Beilby's special interests lay. In general, the awards are not applicable to the more senior investigators, but are granted as an encouragement to relatively young men who have done independent work of exceptional merit over a period of years.

INSTITUTION OF METALLURGISTS

The following were elected to the different grades of membership on 16 March 1949 :

As Fellows

BRANDES, Eric Adolph, B.Sc., A.R.C.S. (Fulmer Research Institute).

THORNEYCROFT, William Ernest, B.Sc. (Birmingham Central Technical College).

NEWS AND ANNOUNCEMENTS

As Fellows from Grade of Associate

- HARPER, Henry Graham (Vickers-Armstrongs, Ltd.).
KILLINGWORTH, Donald, B.Sc. (Ruston and Hornsby, Ltd.).
ROTHERHAM, Leonard, M.Sc., F.Inst.P. (Royal Aircraft Establishment).
SCOTT, Barry Alderson, B.Sc., Ph.D., A.R.C.S., F.R.I.C. (British Aluminium Co., Ltd.).

As Associates

- BURNETT, Jack, A.Met. (United Steel Companies, Ltd.).
FAGG, Dennis Norman, B.Met. (British Non-Ferrous Metals Research Association).
FRANKLIN, Arthur William, B.Sc. (Mond Nickel Co., Ltd.).
FRANKLIN, William Robert (Ministry of Supply).
HALL, Edward Berney, B.Sc., A.R.C.S. (Bird and Co., Ltd., Calcutta).
MACQUARIE, Charles, B.Sc., A.R.T.C. (Stewarts and Lloyds, Ltd.).
PUGH, Stanley Frederick, M.A. (Imperial Chemical Industries, Ltd.).
TEDDS, Dennis Frederick Bernard (Bristol Aeroplane Co., Ltd.).
WATKINS, Brychan, M.Sc. (Stewarts and Lloyds, Ltd.).
WEBB, Alfred William Owen, B.Sc. (J. Stone and Co., Ltd.).

As Associates from Grade of Licentiate

- COWLEY, Donald Kenneth (Gillette Industries, Ltd.).
HATTERSLEY, Alan, A.Met. (F. M. Parkin (Sheffield), Ltd.).
HERBERT, Frederick William (Blackstone and Co., Ltd.).
KING, Frank (Northern Aluminium Co., Ltd.).
MOORE, Roy Spencer (Manganese Bronze and Brass Co., Ltd.).
NICHOLLS, Christopher (Northeastern Marine Engineering Co. (1938), Ltd.).
SANDERS, James (Consultant).
WISE, Sidney, A.M.I.Mech.E. (British Railways (Southern Region)).
YARDLEY, Francis Edwin (Umbrako Socket Screw Co., Ltd.).

As Licentiates

- AINSLEY, Jack, A.Met. (Kayser Ellison and Co., Ltd.).
BELL, Douglas Irving (British Iron and Steel Research Association).
BHATNAGAR, Parmatma Sarup, M.Sc. (Bombay, Baroda, and Central India Railway).
BOXALL, Derek (Vickers-Armstrongs, Ltd.).
CARTWRIGHT, Harry (Henry Meadows, Ltd.).
CUMBERLAND, John (Sheepbridge Stokes Centrifugal Castings Co., Ltd.).
DEEMING, Arthur Geoffrey (Staveley Iron and Chemical Co., Ltd.).
DOO, Betty (Accles and Pollock, Ltd.).
FEARN, Eric Bernard Nelson (Wm. Jessop and Sons, Ltd.).
GIBLIN, John Francis, B.Eng. (British Insulated Callender's Cables, Ltd.).
HEGGIE, William Pringle (Robert Young and Co., Ltd.).
HIPWELL, Robert Charles (Wolverhampton Metal Co., Ltd.).
McCLUNE, Helen Mary Caroline, B.Sc. (Admiralty Central Metallurgical Laboratory).
PARK, Christopher (Government Chemist's Department).
PAUL, Nripendra Chandra, M.Sc. (Indian Ordnance Factory, Ambarnath).

NEWS AND ANNOUNCEMENTS

ROGERS, Colin Francis (United Wire Works (Birmingham), Ltd.).
SHEPPARD, Norman Frederick (Fairey Aviation Co., Ltd.).
SOUTHAN, Harold Joseph (Accles and Pollock, Ltd.).
SPEIGHT, Kenneth, A.Met. (Renold and Coventry Chain Co., Ltd.).
SYMES, Bruce Mayne (Glacier Metal Co., Ltd.).
TAYLOR, Frank Donald Llewellyn (Imperial Chemical Industries, Ltd.).
TURNER, Donald Howson, A.Met. (United Steel Companies, Ltd.).
WILLIAMS, Rheon Edward Howard (Wellman Smith Owen Engineering Corporation, Ltd.).
WILLIAMSON, Lawrence Joseph, A.Met. (English Steel Corporation, Ltd.).

DIARY FOR JULY

WEDNESDAY, 6 JULY

Institution of Mining and Metallurgy.—Dr. C. H. Desch, F.R.S.: "The Effect of Impurities on the Properties of Metals". Sir Julius Wernher Memorial Lecture. (Royal Institution, 21 Albemarle St., London, W.1, at 5 p.m.)

THURSDAY & FRIDAY, 7 & 8 JULY

Institution of Mining and Metallurgy.—Symposium on "The Refining of Non-Ferrous Metals". (Royal Institution of Chartered Surveyors, 14 Great George St., London, S.W.1, from 10 a.m. to 5 p.m.)

SATURDAY 9 TO SATURDAY 23 JULY

Fourth Empire Mining and Metallurgical Congress, Great Britain.—For particulars, apply to the Joint Secretaries to the Congress, 436 Salisbury House, Finsbury Circus, London, E.C.2.

WEDNESDAY, 13 JULY

Institute of Welding.—Annual General Meeting. (Institution of Civil Engineers, Great George St., London, S.W.1, at 2.30 p.m.)

APPOINTMENTS REQUIRED

JUNIOR METALLURGIST, 24, Swiss (speaks English, French, and German) seeks technical development post in U.K. or Colonies to complete the industrial experience required for the A.I.M. Two years previous experience in England and Switzerland. Possesses initiative. First-class references obtainable. Box No. 269, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

METALLURGIST, B.Sc. (Hons.), age 31, specialized in powder metallurgy, cemented carbides, and industrial diamond tools, with general experience ranging from laboratory research to production control and general management duties, capable of designing equipment and plant lay-out, seeks position where keenness, hard work, and responsibility will offer success. Box No. 267, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

APPOINTMENTS VACANT

To conform to the requirements of the Control of Engagements Order, 1947, these advertisements are published for the information only of those who are "excepted persons" under the Order.

HENRY WIGGIN AND CO., LTD., manufacturers of nickel and nickel alloy products, have a number of vacancies for senior and junior sales representatives at their Head Office and Area Offices, assistants in the Technical Service section of the Sales Department, and Export Sales Department. All applicants must possess a University Science degree or equivalent, and for the senior posts must also have had sales experience. Applicants for the positions in the Export Sales Department must be able to speak French and German fluently. Applicants must be British by birth, and not over forty-five years of age. Apply by letter to Managing Director, Henry Wiggin & Company, Limited, Wiggin Street, Birmingham, 16.

METALLURGIST. A vacancy occurs with an old-established Company for a metallurgist (preferably not over 45) capable of dealing with development in Non-Ferrous Metals (particularly Bronzes) together with its practical application in the Foundry. Permanent post offering good prospects. Write stating age, qualifications, career to date, and commencing salary desired to Box No. 270, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

METALLURGIST, of degree or L.I.M. standard, required for interesting work on the welding of aluminium alloys. Experience in similar field desirable but not essential. Salary depending on experience, but of the order of £400-£500 per annum. Reply stating age, qualifications, experience, and salary required, to the Director, British Welding Research Association, 29 Park Crescent, London, W.1.

MINISTRY OF SUPPLY invites applications for following unestablished posts in London :

1. **EXPERIMENTAL OFFICER.** Applicants should be aged 28 or over and have experience in fuel technology and boiler water control; some experience of steel manufacture and casting an advantage.

2. **ASSISTANT EXPERIMENTAL OFFICER** for chemical analysis of ferrous and non-ferrous metals and alloys. Applicants must have had practical experience in a works laboratory and be conversant with the use of modern analytical methods, including the spectroscope.

3. **ASSISTANT EXPERIMENTAL OFFICER** for works control of metallurgical processes. A knowledge of ferrous and non-ferrous metallurgy is essential, and applicants should have had practical experience in the use of temperature measuring equipment, control of moulding sands, and heat-treatment of ferrous and non-ferrous metals and alloys. Experience of cold rolling and drawing of non-ferrous metals an advantage.

4. **ASSISTANT EXPERIMENTAL OFFICER**, with a knowledge of physical methods of testing ferrous and non-ferrous materials. Experience of high frequency induction heating of metals and the application of electronics to the control of metallurgical processes desirable.

Minimum qualification is Higher School Certificate, or equivalent, in chemistry or metallurgy; a higher qualification would be an advantage.

Salary will be assessed on age, qualifications, and experience within the following ranges :

Experimental Officer £525-£675.

Assistant Experimental Officer £230 (at age 18) to £490.

Rates for women are somewhat lower.

Write quoting F.380/49A to Technical and Scientific Register (K), York House, Kingsway, London, W.C.2, for application forms which must be returned by 9 July 1949.

REQUIRED URGENTLY, a young person to train in various applications of powder metallurgy. The position offers great scope for a person with initiative, and remuneration will be commensurate with the applicant's ability. Applicants should have had a sound basic training in chemistry and physics, but experience in any other industrial laboratory would not necessarily be a recommendation. Replies to Brontalloy, Ltd., Drighlington, nr. Bradford.

THE ALUMINIUM DEVELOPMENT ASSOCIATION requires an Assistant in the Editorial Department. Applicants should possess metallurgical or engineering knowledge and preferably some knowledge of the aluminium industry. Duties include the sorting of information and some writing. Initial salary approximately £480 per annum, according to qualifications. Applications, giving full details, to be addressed to the Technical Director, 33 Grosvenor Street, London, W.1.

THE BRITISH IRON AND STEEL RESEARCH ASSOCIATION. TECHNICAL ASSISTANT is required by the Mechanical Working Division of the above Association to assist in the administration of research programme. Broad rather than specialized training in engineering, metallurgy, or physics, and Higher National Certificate or University Degree in one of the foregoing branches of science essential. Duties will include literature surveys, preparation of papers for Committees, visits to works, and assistance in certain parts of the research programme. Must be able to write good English. Location of work, London. Age range 22-27. Salary according to age, qualifications, and experience, and will be within the range of £350-£550 per annum. Written applications only, quoting "Mechanical Working" and giving full curriculum vitae to the Personnel Officer, B.I.S.R.A., 11 Park Lane, London, W.1.

NEWS AND ANNOUNCEMENTS

THE CIVIL SERVICE COMMISSIONERS invite applications from men candidates for the following posts of lecturer at the Military College of Science, Shrivenham, nr. Swindon, Wilts., under the War Department :

- (1) SENIOR LECTURER IN ENGINEERING PHYSICS.—1 long-service post.
- (2) SENIOR LECTURER IN ELECTRICAL ENGINEERING.—2 short-service posts.
- (3) LECTURER IN ELECTRICAL ENGINEERING.—1 short-service post.

For the short-service posts the period of service expected will be at least two years.

Candidates must have a University degree in an appropriate scientific subject with first or second class honours, or an equivalent qualification. Applications from candidates taking their final degree examinations in the summer of 1949 will be considered. Candidates for posts 1 and 2 must be at least 26 years of age on 1 August 1949, and for post 3 at least 21 and under 28 years of age on 1 August 1949. The inclusive scales of salary are : Senior Lecturer £670-£860, and Lecturer £380-£620. The initial salary of the Lecturer will be fixed according to qualifications and experience. Superannuation provision is made under the Federated Superannuation System for Universities. Candidates selected for short-service posts will be considered for transfer to long-service posts when they become available.

Facilities for research are available at the College.

Single quarters are available at the College. If owing to the housing shortage, family accommodation in the neighbourhood cannot be obtained, it may be possible to allot War Department quarters at a fair rent until other accommodation becomes available.

Further particulars and a form of application may be obtained from the Secretary, Civil Service Commission, Scientific Branch, 27 Grosvenor Square, London, W.1, quoting No. 2576. Completed applications must be returned by 30 June 1949.

WORKS MANAGER'S DEPUTY required for non-ferrous smelting and refining works in N. Midlands. Should have a sound technical education of degree standard, preferably in metallurgy or chemistry, and at least five years' industrial experience in position of responsibility. Interest in cost and non-technical aspects of works management desirable, also knowledge of technology of lead, tin, and antimony. Salary according to qualifications and experience, in the range £650-£850 per annum. Good house available. Full particulars to Box No. 268, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

"NON-METALLIC INCLUSIONS IN STEEL"

. . . by **M. Baeyertz**

This book brings together, for the first time under a single cover, enough of the basic principles which govern the formation of inclusions, the estimation of their amount in commercial products, and the identification of their mineralogical character to afford the beginner an introduction to the subject. It presents the signposts that keep the beginner from tripping in the crevasse that sometimes seems to lie between the fields of metallurgy, mineralogy, and physical chemistry.

"Inclusions" gives you a survey of the nature and origin of the common types of non-metallic inclusions, and methods that may be used to study them. Two kinds of non-metallic inclusions are generally recognized, and these are considered carefully. One type are those which are entrapped in the steel inadvertently ; the other, those which separate from it because of a change in temperature or composition. The book contains many illustrations and charts.

35 Pages. Red Cloth Binding. 71 Illustrations. 9 x 6 in. \$3.00.

AMERICAN SOCIETY FOR METALS

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BULLETIN ANALYTIQUE

Publication of the Centre National de la Recherche Scientifique, France

The *Bulletin Analytique* is an abstracting journal which appears monthly in two parts, Part I covering scientific and technical papers in the mathematical and physical sciences and their applications, Part II the biological sciences.

The *Bulletin*, which started on a modest scale in 1940, with an average of 10,000 abstracts per part, now averages 35,000 to 45,000 abstracts per part. The abstracts summarize briefly papers in scientific and technical periodicals received in Paris from all over the world, and cover the majority of the more important journals in the world scientific press. The scope of the *Bulletin* is constantly being enlarged to include a wider selection of periodicals.

The *Bulletin* thus provides a valuable reference book both for the laboratory and for the individual research worker who wishes to keep in touch with advances in subjects bordering on his own.

A specially interesting feature of the *Bulletin* is the microfilm service. A microfilm is made of each article as it is abstracted, and negative microfilm copies or prints from microfilm can be purchased from the editors.

The subscription rates for Great Britain are 4000 frs. (£5) per annum for each part. Subscriptions can also be taken out to individual sections of the *Bulletin* as follows:

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Subscriptions can be paid directly to the editors: Centre National de la Recherche Scientifique, 18 rue Pierre-Curie, Paris 5ème. (Compte-chèque-postal 2500-42, Paris), or through Messrs. H. K. Lewis & Co., Ltd., 136 Gower St., London, W.C.1.

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By WILLIAM HUME-ROTHERY, M.A., D.SC., F.R.S.

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Press Opinions of Previous Editions

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THE INSTITUTE OF METALS

4 Grosvenor Gardens, London, S.W.1.

NOTICE TO AUTHORS OF PAPERS

1. Papers will be considered for publication from non-members as well as from members of the Institute. They are accepted for publication in the *Journal*, and not necessarily for presentation at any meeting of the Institute, and should be addressed to The Editor of Publications, The Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.
2. Papers suitable for publication may be classified as:
 - (a) Papers recording the results of original research;
 - (b) First-class reviews of, or accounts of, progress in a particular field;
 - (c) Papers descriptive of works methods, or recent developments in metallurgical plant and practice.
3. Manuscripts and illustrations should be submitted in duplicate. MSS. must be typewritten (*double-line spacing*) on one side of the paper only, and authors are required to sign a declaration that neither the paper nor a substantial part thereof has been published elsewhere. MSS. not accepted are normally returned within 3 months of receipt.
4. Synopsis. Every paper must have a synopsis which, in the case of results of research, should state its objects, the ground covered, and the nature of the results. The synopsis will appear at the beginning of the paper, and should be in a form suitable for use by abstracting organizations.
5. References must be collected at the end of the paper, and *each* must have a number. Initials of authors must be given, and the Institute's official abbreviations for periodical titles (as used in *Met. Abs.*) must be used where known. References must be set out in the style:

W. Rosenhain, *J. Inst. Metals*, 1923, 30, 3 (i.e. year, volume, page).
6. Illustrations. Each illustration must have a number and description; only one set of numbers must be used in one paper. The set of *line figures* sent for reproduction must be drawn in Indian ink on smooth white Bristol board, good-quality drawing paper, co-ordinate paper, or tracing cloth, which are preferred in the order given. Co-ordinate paper, if used, must be blue-lined with the co-ordinates to be reproduced *finely* drawn in Indian ink. All lettering and numerals, &c., should preferably be in *pencil*. Figures should be drawn approximately twice the size intended for reproduction. *Photographs* must be restricted in number, owing to the expense of reproduction, and trimmed to the smallest possible of the following sizes, consistent with adequate representation of the subject: 3 in. deep by 4 in. wide (two photomicrographs to a plate); 3 in. deep by 2½ in. wide (four to a plate); 2 in. deep by 2½ in. wide (six to a plate). Magnifications of photomicrographs must be given in each case. Photographs for reproduction should be loose, not pasted down (and not fastened together with a clip, which damages them), and the figure number should be written on the back of each. Legends should be given to photomicrographs, but lengthy descriptions should be avoided owing to the very limited space available on the plates. Illustrations that are not *essential* to the appreciation of the paper should not be included. Only in exceptional cases will illustrations be reproduced if already printed and readily available elsewhere.
7. Tables or Diagrams. Results of experiments, &c., may be given in the form of tables or figures, *but* (unless there are exceptional reasons) *not both*.
8. Overseas Authors. Authors resident in countries distant from Great Britain are requested to name, if possible, agents in Britain to whom may be referred matters concerning their papers, including proofs for correction. Translations from foreign languages should preferably be accompanied by a copy of the MS. in the language of the author.
9. Offprints. Individual authors are presented with 50, two authors with 70, and three with 90, offprints of their papers (in cover) from the *Journal*. Limited numbers of additional offprints can be supplied at the author's expense if ordered before proofs are passed for press. (Orders should preferably be placed when submitting the MSS.)
10. Prizes for Papers. Each year the following awards are made for papers published in the *Journal*: (a) Capper Pass Award for papers on processes or plant used in the fabrication of non-ferrous metals; (b) W. H. A. Robertson Medal, and Premium for papers on engineering aspects of non-ferrous metallurgy.

THE INSTITUTE OF METALS

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4 GROSVENOR GARDENS, LONDON, S.W.1

Telephone :

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INSTITUTE NEWS AND ANNOUNCEMENTS

ELECTION OF COUNCIL

In accordance with the Articles of Association, the following are due to retire from the Council at the 1950 Annual General Meeting :

President :

SIR ARTHUR SMOUT, J.P.

Past-President :

LIEUT.-COLONEL SIR JOHN GREENLY, K.C.M.G., C.B.E., M.A.

Vice-President :

JOHN CARTLAND, M.C., M.Sc.

Ordinary Members of Council :

N. P. ALLEN, D.Sc., M.Met.

J. W. JENKIN, Ph.D., B.Sc.

PROFESSOR H. O'NEILL, D.Sc., M.Met.

PROFESSOR F. C. THOMPSON, D.Met., M.Sc.

The President and Past-President are not eligible for re-election. The Vice-President is not eligible for re-election in that office, but is eligible for election as President (for which there is a vacancy) or Honorary Treasurer (for which there is no vacancy). The Ordinary Members of Council are not eligible for re-election except as President, Vice-President, or Honorary Treasurer (no vacancy).

In addition, the following Ordinary Member of Council, appointed (under Article 28) during the present year to fill a casual vacancy, retires and is eligible for re-election :

G. V. RAYNOR, D.Sc., D.Phil., M.A.

In accordance with Articles 22 and 28, the Council nominates the following members to fill the vacancies :

As President :

H. S. TASKER, B.A., Chairman, Goodlass Wall and Lead Industries, Ltd., London ; Vice-Chairman, British Non-Ferrous Metals Research Association.

NEWS AND ANNOUNCEMENTS

As Vice-Presidents :

PROFESSOR H. O'NEILL, D.Sc., M.Met., Professor of Metallurgy, University College of Swansea, University of Wales.

PROFESSOR F. C. THOMPSON, D.Met., M.Sc., Professor of Metallurgy, Manchester University.

As Ordinary Members of Council :

G. L. BAILEY, M.Sc., Director, British Non-Ferrous Metals Research Association, London.

HARRY DAVIES, Technical Manager, Imperial Chemical Industries, Ltd., Metals Division, Swansea.

E. H. JONES, Director and General Manager, Capper Pass and Son, Ltd., Bristol.

L. B. PFEIL, O.B.E., D.Sc., A.R.S.M., Manager, Development and Research Department, The Mond Nickel Company, Ltd., London.

G. V. RAYNOR, D.Sc., D.Phil., M.A., I.C.I. Research Fellow in Industrial Metallurgy, Birmingham University.

Members are reminded that, in accordance with Article 22, any ten members may also, at or before the Autumn General Meeting (3-8 October 1949), nominate in writing, with the written consent to act if elected of the person nominated, any duly qualified person other than one of those nominated by the Council to fill any vacancy on the Council, but each such nominator is debarred from nominating any other person for the same election. If two or more persons are nominated for any honorary office they (or such of them as are not Ordinary Members of Council who are not retiring at the next Annual General Meeting) will be deemed to have been nominated also for any vacancies among the Ordinary Members of Council. No person is eligible to fill any vacancy at such Annual General Meeting unless he has consented in writing to be nominated and has been nominated or deemed to be nominated for the same in compliance with this Article.

SENIOR VICE-PRESIDENT

The Council has elected MR. A. J. MURPHY, M.Sc., as Senior Vice-President for the year 1950-51, in the event of the election of MR. H. S. TASKER, B.A., as President for that year.

SYMPOSIUM ON METALLURGICAL APPLICATIONS OF THE ELECTRON MICROSCOPE

This one-day Symposium is being organized by the Institute of Metals in association with the Chemical Society, Electron Microscopy Group of the Institute of Physics, Faraday Society, Institution of Electrical Engineers, Physical Society, Iron and Steel Institute, and Royal Microscopical Society.

It will be held in the Lecture Theatre of the Royal Institution, 21 Albemarle Street, London, W.1, on 16 November 1949.

About a dozen papers, from Britain and abroad, which will be issued as preprints, are to be discussed, and it is proposed to publish the papers and proceedings of the Symposium in the form of a volume in the Institute's Monograph and Report Series.

An exhibition of related apparatus will be held during the meeting, and it is hoped that there will be a good attendance and that all those interested in the subject will help to make the discussion a full and useful one.

Fuller details of the programme will be issued in due course, but in the meantime it would be of assistance if members would make these arrangements known among their associates.

PERSONAL NOTES

PROFESSOR W. G. BURGERS of the Laboratory for Physical Chemistry, Technical University, Delft, Holland, will take up the appointment of "Visiting Professor" at Purdue University, Lafayette, Indiana, U.S.A., in the autumn term of the collegiate year 1949-1950.

MR. G. H. A. FIELD was appointed a Commander of the British Empire in the Birthday Honours List.

MR. H. A. HOARE has taken up an appointment as Technical Assistant in the Laboratory of the De Havilland Aircraft Co., Ltd., Aircraft Division.

DR. R. MADDIN is now at the Department of Mechanical Engineering, Johns Hopkins University, Baltimore 18, Maryland, U.S.A.

DR. W. I. PUMPHREY has been awarded a Commonwealth Fund Fellowship for study and travel in the United States and intends to leave for America later in the year.

MR. F. M. STEARN has left the Appleby-Frodingham Steel Co., Ltd., and has been appointed an Assistant Metallurgist in the Process Development Department of Henry Wiggin and Co., Ltd., Birmingham.

MR. A. W. TRASH, Chief Chemist to Messrs. H. J. Enthoven and Sons, Ltd., has now completed 40 years' service with the Company.

MR. TREMBATH WATSON has been elected President of the Institute of Australian Foundrymen for 1949. Mr. Watson represented the Institute of Australian Foundrymen at the Second Annual Congress of the Australian Institute of Metals, held in May at Newcastle, N.S.W.

PROFESSOR A. VON ZEERLEDER, Director of the Research Department of the Aluminium Industrie A.G., was awarded the degree of Doctor *honoris causa* of Mining Engineering Science at the centenary celebrations of the Montanistische Hochschule Leoben, Austria, in recognition of his research work in the field of light metals.

BIRTH

WATSON.—On 10 March 1949, at Sydney, Australia, to Mrs. Trembath Watson, a daughter (Joy Sandra).

DEATHS

The Editor regrets to announce the deaths of the undermentioned members :

DR.-ING. K. BROZYNA, on 7 April 1949.

MR. E. A. SMITH, A.R.S.M., of Hastings, an Original Member of the Institute, on 7 April 1949.

NEWS OF LOCAL SECTIONS AND ASSOCIATED SOCIETIES

SOUTH WALES LOCAL SECTION

At a meeting of the Section held on 31 May 1949 at the Metallurgical Department, University College, Swansea, Mr. H. R. Brooker of Messrs. Johnson Matthey and Co., Ltd., London, delivered a lecture on "Brazing".

The lecture briefly defined the field which is now recognized as being covered by the term "brazing" and went on to consider the various types of materials used as brazing alloys, as well as their attendant fluxes.

A review of the equipment used in variants of the process was associated with a discussion of the reasons for the selection of a particular process for joining a given assembly, appreciation of the different techniques being assisted by the use of suitable slides.

In dealing with aspects of the design and strength of brazed joints, the lecturer presented the results of investigations covering the variation of joint strength with joint clearance and examination of the fatigue strengths of silver alloy brazed joints in brass and mild steel.

In view of the relative importance of torch brazing as compared with the more modern but less frequently employed automatic heating processes, hand methods were described in more operational detail. There followed an interesting colour film with commentary on the simple essentials to good results in hand torch brazing which added realism to the verbal descriptions which had preceded it.

OTHER NEWS

NEW DIRECTOR OF THE NATIONAL PHYSICAL LABORATORY

The Lord President of the Council has appointed Professor E. B. Bullard, M.A., Ph.D., F.R.S., Professor of Physics in the University of Toronto, to be Director of the National Physical Laboratory. It is expected that Professor Bullard will take up the appointment in January 1950.

Professor Bullard will succeed Sir Charles Darwin, K.B.E., M.C., Sc.D., F.R.S.

Professor Bullard, who is forty-one years old, was educated at Repton and Clare College, Cambridge, where he studied physics.

In 1931, when the College decided to create the post of demonstrator in geodesy, Professor Bullard was appointed and worked out improved methods of recording the times of the swing of pendulums for determining the force of gravity. He tested the methods at various places in the British Isles and in East Africa, in the Rift Valley region, where accurate measurements were made with great success.

Elected to the Smithsonian Research Fellowship of the Royal Society in 1936, Professor Bullard continued to work at Cambridge and took up geophysical methods of determining the geology of the earth's crust. This work involved exploding a charge in a hole 12 ft. deep and detecting the arrival of the vibrations at various points away from the explosion, from which the depth of the palæozoic floor can be deduced. Most of these experiments were carried out in East Anglia.

When war broke out in 1939, Professor Bullard joined the Admiralty. His most important work was on the de-gaussing of ships against the magnetic mine and he was also concerned with measures against the acoustic mine. From 1944 to 1945 he was Assistant Director of Naval Operational Research. He was elected a Fellow of Clare College in 1943, and when the war ended again took up his geophysical work until 1948, when he was appointed Professor of Physics at Toronto University.

He was made a Fellow of the Royal Society in 1941.

AERONAUTICAL CONGRESS

The first Congrès International des Industries Aéronautiques, held in Paris from 9 to 18 May, included a section presided over by Professor Albert Portevin and devoted to the development of materials.

Some interesting papers were presented on materials employed in aircraft construction: light alloys and high-temperature-resistant alloys. Concerning the latter, papers were read by Dr. Pfeil on alloys for turbine blades, and by Dr. Sykes on alloys for turbine rotors.

INTERNATIONAL INSTITUTE OF WELDING

The Governing Council and the Technical Commissions of the International Institute of Welding, presided over by Mr. Goldschmidt, met at Delft from 16 to 20 May and discussed their programme of work.

The next meetings are expected to be held in France, in England, and in Sweden.

INTERNATIONAL CONGRESS OF INDUSTRIAL CHEMISTRY

The 22ème Congrès International de Chimie Industrielle, organized by the Société de Chimie Industrielle, 28 rue Saint-Dominique, Paris (7), will take place in Barcelona, from 23 to 30 October 1949.

Sections devoted to analysis and metallurgy will form part of the Congress.

APPOINTMENTS VACANT

AN EXPERIENCED RESEARCH WORKER, with good academic qualifications, is required for non-ferrous metallurgical investigations in the London laboratory of a well known Company. Salary according to qualifications but not less than £800 per annum. Applications, giving full particulars, should be sent to Box No. 272, Institute of Metals, 4, Grosvenor Gardens, London, S.W.1.

ASSISTANT METALLURGICAL AND ELECTRO-CHEMIST wanted for Laboratory Controlling Works. Attractive opportunity for advancement in one of the factories of world-famous Electrical Plant Manufacturers. London District. Age 21-25, Inter-Science standard, opportunity to attend day classes and complete degree. Some industrial or commercial experience, and any knowledge of metallurgy, electro-chemistry, and rubber technology an advantage. Apply stating age, qualifications, and salary required to Box No. 271, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

BIRLEC LIMITED require immediately several technically trained young Sales Engineers. Applicants must have personality and preferably, though not necessarily, some furnace knowledge and selling experience. Reply to: Sales Director, Birlec Limited, Erdington, Birmingham 24.

CHIEF INFORMATION OFFICER required by large laboratories in Midlands dealing mainly with research and development of aluminium and magnesium and their alloys and their application to industry. Person appointed would also be responsible for supervision of extensive library and of central filing system. Good scientific qualifications essential. Commencing salary will be commensurate with experience and qualifications. Box No. 273, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

ENGLISH ELECTRIC require experienced Senior Research Metallurgist for work in their Laboratories at Stafford. Apply quoting Ref. 244 and stating salary required to Central Personnel Service, English Electric Co., Ltd., 24/30 Gillingham Street, Westminster, London, S.W.1.

HENRY WIGGIN & CO., LTD., manufacturers of nickel and nickel alloy products, have a number of vacancies for Senior and Junior Sales Representatives at their Head Office and Area Offices, Assistants in the Technical Service section of the Sales Department, and Export Sales Department. All applicants must possess a University Science degree or equivalent, and for the senior posts must also have had sales experience. Applicants for the positions in the Export Sales Department must be able to speak French and German fluently. Applicants must be British by birth, and not over forty-five years of age. Apply by letter to Managing Director, Henry Wiggin & Company, Ltd., Wiggin Street, Birmingham, 16.

THE BRITISH NON-FERROUS METALS RESEARCH ASSOCIATION has vacancies as follows: **RESEARCH DEPARTMENT**: Metallurgists, Physical Chemists, and Physicists in investigator and research assistant posts. Applicants must be British and possess a good degree or have equivalent qualifications. **LIAISON DEPARTMENT**: Metallurgist for work in the application of research results to industrial practice. Applicants should have a degree or equivalent qualifications and preferably some industrial experience—personality and tact are essential. Commencing salaries up to £650 p.a. according to qualifications and experience. Apply to The Secretary, British Non-Ferrous Metals Research Association, 81-91 Euston Street, N.W.1.

TWO VACANCIES FOR GRADUATES have arisen on the staff of the Research Laboratories of the General Electric Co., Ltd., East Lane, North Wembley, Middlesex. (a) **WELDING METALLURGIST**, preferably with experience of work on the metallurgical aspects of welding. (b) **METALLURGIST** to investigate problems relating to heat-resisting surfaces, including the fundamental study of the diffusion of metals in the solid state. Applications should be addressed to the Personnel Officer, giving age, qualifications, and experience.

THE INSTITUTE OF METALS

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INSTITUTE NEWS AND ANNOUNCEMENTS

HONORARY CORRESPONDING MEMBER TO THE COUNCIL FOR SOUTH AFRICA

Professor L. Taverner, A.R.S.M., D.I.C., Professor of Metallurgy and Assaying at the University of the Witwatersrand, Johannesburg, has been elected an additional Honorary Corresponding Member to the Council for South Africa.

FORTY-FIRST ANNUAL AUTUMN MEETING IN FRANCE

As previously announced, by invitation of the Société Française de Métallurgie and the French Non-Ferrous Metal Industries, the 1949 Autumn Meeting will be held in France. Full particulars have been sent to all members in the form of a 16-page programme with reply form.

The meeting will be in two parts. Part I, consisting of the scientific and technical sessions and visits to works and laboratories in the area of Paris, will be held in Paris from Monday, 3 October to Saturday, 8 October, inclusive. Part II, consisting of a series of four tours to various parts of France, and including visits to important non-ferrous metallurgical works, will commence on Sunday, 9 October.

A very influential Reception Committee, whose names are given on p. 185, has been formed to welcome members to Paris, and an interesting programme has been arranged. At the same time as the meeting of the Institute of Metals, and in the same building, the Société Française de Métallurgie will hold its annual meeting, but care will be taken to ensure that the sessions of the two societies dealing with non-ferrous metallurgy do not clash.

The holding of these two conferences in Paris at the same time, will provide an excellent opportunity for French, British, and other continental members to meet each other in most agreeable circumstances ; many members will be present from non-European countries also.

The Council hopes that there will be a very large attendance of members at this meeting, which is the first to be held outside the British Isles since 1936. Members are requested to complete and return the reply form (already distributed with the programme) as early as possible. It is emphasized, however, that



Top: Notre Dame. Centre: Place de la Concorde, with the Eiffel Tower in background. Bottom: The Sacré-Cœur.

arrangements will be made for those members who are unable to notify their intention to attend until the week before the meeting takes place.

Those who desire to have their travel and hotel arrangements made for them, should apply to Messrs. Thos. Cook and Son, Ltd., Post Order Department, Berkeley Street, London, W.1., quoting reference POD/S/7800. This organization has reserved rooms for members in Paris (accommodation is very difficult to get, because the Salon d'Automobile will be held in Paris during the first week of the Institute's meeting), and has reserved train accommodation with meals en route, and the services of a courier, for members and their guests travelling to Paris on Sunday, 2 October, and returning from Paris on Sunday, 9 October.

Reception Committee

Chairman : M. le Général Nicolau, Président de la Société Française de Métallurgie.

Honorary Secretary : M. Eugène Dupuy, Secrétaire-Général, Société Française de Métallurgie.

M. d'Auigny, Président, Compagnie Générale du Duralumin et du Cuivre, Paris.

M. Bellier, Directeur, Mines et Fonderie de Zinc de la Vieille-Montagne, Paris.

M. Caron, Directeur, Compagnie Royale Asturienne des Mines, Paris.

M. Chaudron, Professeur à la Faculté des Sciences, Paris.

M. Chevenard, Membre de l'Institut, Paris.

M. Desbordes, Directeur, La Canalisation Electrique, Saint-Maurice.

M. Desbriere, Directeur Général, Compagnie Française des Métaux, Paris.

M. Dhavernas, Directeur, Centre d'Information du Nickel, Paris.

M. Dumas, Directeur, L'Aluminium Français, Paris.

M. Dupin, Président, L'Aluminium Français, Paris.

M. François Gall, Directeur, Société d'Electrochimie, d'Electrometallurgie et des Aciéries Electriques d'Ugine, Paris.

M. Jaudeau, Directeur Administrateur, Tréfileries et Laminoirs du Havre, Paris.

M. Léon Lamy, Directeur, Compagnie Française de l'Etain, Paris.

M. Leroy, Directeur, Institut de Soudure, Paris.

M. Matter, Directeur, Compagnie de Produits Chimiques et Electrometallurgiques Alais, Froges et Camargue, Paris.

M. Jean Montupet, Société Montupet et Cie., Paris.

M. Pagezy, Directeur Général, Société Minière et Métallurgique de Penarroya, Paris.

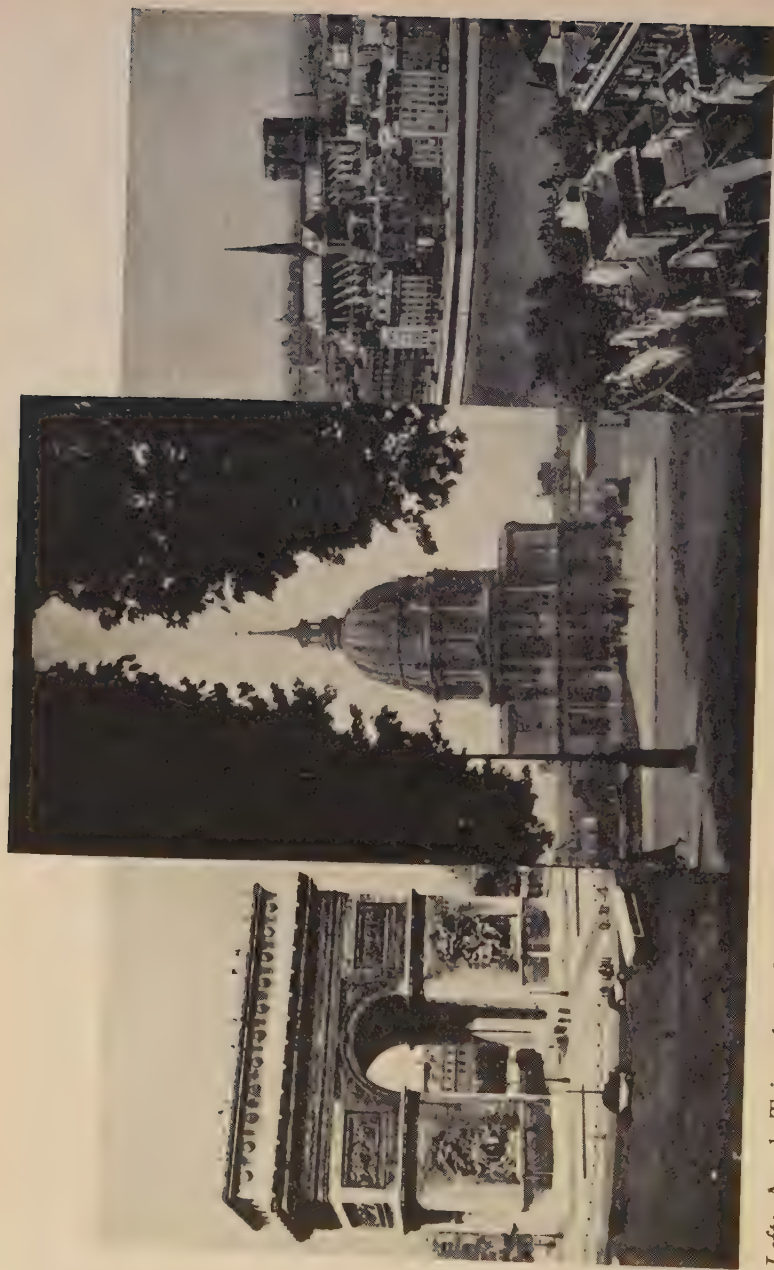
M. le Général Perreau, Secrétaire Administratif, Société Française de Métallurgie, Paris.

M. A. Portevin, Membre de l'Institut, Paris.

M. de Vitry, Vice-Président Directeur Général, Compagnie de Produits Chimiques et Electrometallurgiques Alais, Froges et Camargue, Paris.

Ladies' Committee

The following ladies have kindly consented to serve on the Ladies' Committee : Mesdames d'Auigny, Baron, Caron, Chaudron, Chevenard, Dumas, Dupin, Dupuy, François Gall, Matter, J. Montupet, Nicolau, Portevin, and de Vitry.



Left: Arc de Triomphe. Centre: Les Invalides. Right: View towards the Isle de la Cité, showing Nôtre Dame.

PROGRAMME

PART I

Monday, 3 October

9.30 a.m.—The Secretary's Office will be open at the Maison de la Chimie, 28 rue St. Dominique, Paris 7e, for the issue of tickets, badges, and general information. Messrs. Thos. Cook & Son, Ltd., have been asked to provide facilities at the Secretary's office for the exchange of money and for the issue of tickets for local sightseeing parties, ladies' visits, theatre tickets, &c.

Visits to :

Morn. & Aft.—Versailles. The party will travel by road, lunch will be arranged at Versailles, and a visit will be paid in the afternoon to the Château, the Grand Trianon, and the Petit Trianon.

2.30 p.m., approx.—Laboratories of the Centre National de la Recherche Scientifique, Vitry. (Maximum : 40.)

All day.—Other visits to places of local interest can be arranged through Messrs. Thos. Cook & Son, Ltd. (*Note*.—Most stores and shops in Paris are closed on Mondays.)

8.45 p.m. for 9.0 p.m.—Twenty-Seventh Autumn Lecture by Professor Georges Chaudron on "Recent French Work in the Field of Light Alloys" at the Maison de la Chimie, 28 rue St. Dominique, Paris, 7e.

10.0 p.m.—Informal Conversazione in the Maison de la Chimie, by invitation of the Reception Committee.

Tuesday, 4 October

9.30 a.m. to 12.30 p.m.—The Secretary's office will be open at the Maison de la Chimie.

9.45 a.m.—Official welcome to Members and their ladies, followed by a brief business meeting.

Discussion of the following papers :

(1) Jointly: J. MATTER and M. LAMOURDEDIEU: "The New Factory of the Société Centrale des Alliages Légers at Issoire (Puy-de-Dôme) for the Working of Light Alloys" (No. 1189; Aug. 1949), and W. J. THOMAS and W. A. FOWLER: "Some Technical Problems Influencing Production Economy in the Rolling of Aluminium" (No. 1190; Aug. 1949).

(2) W. I. PUMPHREY and D. C. MOORE: "Some Effects of Silicon on the Tendency to Cracking in Aluminium-Copper-Magnesium Alloys of High Purity" (No. 1178; May 1949).

10.0 a.m.—Ladies. Visit to the margarine factory of the Société ASTRA, Asnières (Seine) (max. 60 persons), or morning available for local visits to places of interest, e.g. Notre Dame, La Sainte-Chapelle, the Louvre, Palais de Chaillot, Eiffel Tower, &c., which can be arranged through Messrs. Thos. Cook & Son, Ltd., on arrival in Paris.



Above: The Hôtel de Ville. Below: View of part of the Isle de la Cité, showing the Palais de Justice and the spire of La Sainte-Chapelle.

NEWS AND ANNOUNCEMENTS

12.30 p.m.—Meeting adjourns.

1.15 p.m.—Lunch (informal) at the Hôtel du Palais d'Orsay, 7 and 9 Quai d'Orsay, Paris, for those members and ladies who desire it. (Tickets: Frs. 500, inclusive of service but exclusive of wines.)

2.15 p.m., approx.—Members' Visits (any limit as to numbers is stated in parentheses below):

1. Le Magnésium Industriel, Levallois (15).
2. Manufacture d'Armes de Paris (M.A.P.), St. Denis.
3. Laboratories of the Centre National de la Recherche Scientifique, Bellevue.
4. Compagnie Facel-Metallon, Colombes (25).
5. Locomotive Testing Plant, Vitry-sur-Seine.
6. Michelin pneumatic-tyred train at the Gare de l'Est. (No transport charge.)

Ladies' visit:

Display of moderately-priced dresses at a well-known dress-making establishment.

8.0 p.m.—Banquet, to which each member, accompanied by one lady, is invited by the Société Française de Métallurgie and the French Non-Ferrous Metallurgical Industries. (Evening Dress or Uniform, *with decorations*.) The banquet will be held at the Cercle Interallié, 33 Faubourg Saint-Honoré.

Wednesday, 5 October

9.30 a.m.—The Secretary's Office will be open at the Maison de la Chimie.

10.0 a.m.—Discussion of the following papers:

- (1) A. M. PORTEVIN and M. DANNENMULLER: "Segregation and Liqutation in Alloys and their Application to Non-Ferrous Metallurgy" (No. 1191; Aug. 1949).
- (2) G. R. WILMS and W. A. WOOD: "Mechanism of Creep in Metals" (No. 1176; April 1949).
- (3) W. A. WOOD and W. A. RACHINGER: "Crystallite Theory of Strength of Metals" (No. 1169; Mar. 1949).
- (4) If time permits: G. E. BENNETT and R. M. DAVIES: "An Experimental Investigation, by a Dynamical Method, of the Variation of Young's Modulus with Temperature" (No. 1181; May 1949).

10.0 a.m.—Ladies. Morning free for visits to places of interest.

12.30 p.m.—Meeting adjourns.

1.15 p.m.—Lunch (informal) at the Hôtel du Palais d'Orsay for those members and ladies who desire it. (Tickets, Frs. 500, inclusive of service but exclusive of wines.)

2.15 p.m., approx.—Members' Visits (any limit as to numbers is stated in parentheses below):

1. Centre Technique de l'Aluminium, Paris.
2. Japy Works, Arcueil.
3. Régie Nationale des Usines Renault, Billancourt (30).
4. Cable Works of the Société des Tréfileries et Laminiers du Havre, Saint Maurice (20).

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Ladies' Visit :

Vinay chocolate factory (limit 20).

Late afternoon.—Civic Reception at the Hôtel-de-Ville.

Evening.—Free for members' own arrangements.

Thursday, 6 October

10.0 a.m.—All-day visit to the Château de Chantilly, the Fonderies Montupet at Creil and, by invitation of the Institut de France, the Abbaye de Royaumont. Before lunch members may visit the Foundry. Lunch will be taken at the Abbaye de Royaumont. (The price of tickets for this all-day visit, including transport, entrance to the Abbaye, and lunch, will be Frs. 1700.)

Evening.—Free for members' own arrangements.

Friday, 7 October

9.30 a.m.—The Secretary's Office will be open at the Maison de la Chimie.

9.45 a.m.—Discussion of the following papers :

- (1) Jointly : R. CHADWICK and W. H. L. HOOPER : " Observations on the Recrystallization Characteristics of Aluminium-Magnesium-Manganese Alloys " (No. 1171 : Mar. 1949), and R. CHADWICK, T. LL. RICHARDS, and K. G. SUMNER : " The Effect of Rolling and Annealing Procedures on the Structure and Grain-Size of Aluminium-Copper-Magnesium Alloy Strip " (No. 1172 ; April 1949).
- (2) E. F. EMLEY : " Non-Metallic Inclusions in Magnesium-Base Alloys and the Flux-Refining Process " (No. 1165 ; Feb. 1949).
- (3) A. B. MIDDLETON, L. B. PFEIL, and E. C. RHODES : " Pure Platinum, of High Recrystallization Temperature, Produced by Powder Metallurgy " (No. 1170 : March 1949).
- (4) If time permits : Jointly : W. A. BAKER and A. P. C. HALLOWES : " The Elimination by Lithium of Bismuth Embrittlement in Deoxidized Coppers and Copper Alloys " (No. 1180 ; May 1949), and A. P. C. HALLOWES : " The Embrittlement of Tough-Pitch Copper by Bismuth " (No. 1184 ; June 1949).

10.0 a.m.—Ladies. Morning free for visits to places of interest.

12.30 p.m.—Conclusion of scientific and technical sessions.

1.15 p.m.—Lunch (informal) at the Hôtel du Palais d'Orsay for those members and ladies who desire it. (Tickets, Frs. 500, inclusive of service but exclusive of wines).

Afternoon.—Osmond Centenary Ceremony at the Sorbonne, at which the President of the Republic will be present and to which all members and ladies are invited. (Light refreshments will be served after the ceremony.)

Evening.—Free for members' own arrangements.

Saturday, 8 October

It is suggested that members and ladies may care to visit the Salon d'Automobile. The day is left free for private arrangements or engagements.

9.30 a.m.—12.30 p.m.—The Secretary's Office at the Maison de la Chimie will be open to deal with enquiries.

Sunday, 9 October

Return to London for those members who are travelling under arrangements made by Messrs. Thos. Cook & Son, Ltd., and who are not participating in Part II of the programme.

PART II

Full details of the cost of combined travel and hotel arrangements for the tours in Part II of the meeting programme are given in a circular issued by Messrs. Thos. Cook & Son, Ltd.; this is available on request. (See also under Travel and Hotel Accommodation on p. 193.)

Tour A.—Comprising visits to the works of the Société Centrale des Alliages Légers (SCAL), and the Société pour le Forgeage et l'Estampage des Alliages Légers (FORGEAL) at Issoire (Puy-de-Dôme); the works of the Manufacture Métallurgique de Gerzat at Clermont-Ferrand; and a tour of the Massif-Central.

Time Table.

Sun., 9 Oct., evening.—Leave Paris for Clermont-Ferrand, where the party will spend the night.

Mon., 10 Oct.—Works visits; lunch by invitation of the Company; night at Clermont-Ferrand.

Tues., 11 Oct.—All-day tour of the Massif-Central by road, returning to Paris by an evening train. Night spent in Paris.

Cost: (a) Rail-fare (return) to Clermont-Ferrand, dinner en route, hotel (bed-and-breakfast) in Paris on night 11–12 Oct., and gratuities, booked through Thos. Cook & Son, Ltd., 2nd Class (£7 9s., £2 of which is payable in francs).

(b) Hotel at Clermont-Ferrand nights of Sun., 9 Oct., and Mon., 10 Oct., meals at Clermont-Ferrand Mon., 10 Oct., and Tues., 11 Oct., and transport for works' visits and tour of Massif-Central, 6000 francs, payable at Secretary's office in Paris.

Tour B.—Comprising visits to the Fonderie et Forges de Crans, Annecy (Savoie); the works of the Compagnie Française de l'Étain at Annecy-Vovray and a famous Bell Foundry at Annecy; the Laboratoire du Service des Recherches, Compagnie de Produits Chimiques et Electrométallurgiques Alais, Froges et Camargue, Chambéry, and the works of the same Company at St. Jean-de-Maurienne.

Time Table.

Sun., 9 Oct., late evening.—Leave Paris by train (sleeping berths).

Mon., 10 Oct.—Arrive Annecy; breakfast at hotel; visits to works at Annecy; night at Annecy.

NEWS AND ANNOUNCEMENTS

Tues., 11 Oct.—Leave Annecy by car for Chambéry; visits to laboratories and works at Chambéry and St. Jean-de-Maurienne; lunch by invitation of the Company.

Wed., 12 Oct.—Return from Chambéry at 0.44 hrs. by sleeping car to Paris. Arrive London 7.50 p.m.

Cost : 2nd Class, £16 5s. (£5 10s. of which is payable in francs).

Tour C.—Comprising a tour of the Châteaux of the Loire, and including a visit to the works of the Compagnie Facel-Metallon, at Amboise, where parts are made for the Dyna-Panhard car.

Time Table.

Mon., 10 Oct.—Leave Paris by car for tour of the Châteaux; night at Amboise.

Tues., 11 Oct.—Continue tour of the Châteaux; night at Tours.

Wed., 12 Oct.—Conclude tour of the Châteaux, returning to Paris to catch the Night Ferry (sleeping berths) to England.

Thurs., 13 Oct.—Arrive London at 9.10 a.m.

Cost : 2nd Class, £19 4s. 6d. (£14 10s. of which is payable in francs).

Tour D.—Comprising a tour in Normandy, including visits to Rouen; Le Havre; Deauville; the works of the Compagnie Générale du Duralumin et du Cuivre at Dives; Caen, and the battlefields and beaches.

Time Table.

Mon., 10 Oct.—Leave Paris by car for Rouen. Lunch at Rouen; leave Rouen after lunch for Le Havre and Deauville; night spent at Deauville.

Tues., 11 Oct.—Visit to the works of the Compagnie Générale du Duralumin et du Cuivre at Dives; lunch at Dives; leave by car for Caen; night spent at Caen.

Wed., 12 Oct.—Visits by car to the battlefields, beaches, &c., returning to Rouen in time to catch the Night Ferry (sleeping berths) train from Paris.

Thurs., 13 Oct.—Arrive London at 9.10 a.m.

Cost : 2nd Class, £21 9s. (£16 10s. of which is payable in francs.).

IMPORTANT NOTE.—On this tour it will only be possible for each passenger to take a light suitcase. Messrs. Thos. Cook & Son, Ltd., will take care of other baggage, or it may be forwarded in advance on Sunday, 9 October.

GENERAL INFORMATION

Registration.—A registration fee of 30s. for members and 15s. for ladies and others accompanying members, will be charged to cover administration expenses. This fee can be paid in sterling in England prior to the meeting, or in francs in Paris. In acknowledgement of their Reply Forms, members will receive an Exchange

Ticket which should be exchanged, at the Secretary's Paris office, for the tickets for which members have applied.

Travel and Hotel Accommodation.—Arrangements for combined travel and hotel accommodation have been made with Messrs. Thos. Cook & Son, Ltd. Members desiring to take advantage of these arrangements should complete a separate travel order form, in addition to the Reply Form concerning the meeting. Full details of hotel and travel arrangements (including a travel order form) have been sent by Messrs. Thos. Cook & Son, Ltd., to those members who have stated that they desire these arrangements to be made for them by that organization. Other members who wish to receive this information should apply *at once* direct to Messrs. Thos. Cook & Son, Ltd., Post Order Department, Berkeley St., London, W.1, quoting reference POD/S/7800.

Specimen hotel and travel rates for 7 days' stay are given below, but full details are given in Messrs. Thos. Cook & Son's Circular.

On 1 September, as notified in the programme already circulated to all members, Messrs. Thos. Cook and Son released all surplus accommodation of the amount provisionally reserved for members, but they will endeavour to book rooms for members who have to make late application.

Travel to Paris and 1st Class Hotel.

Single Room	£23 12s. (£11 10s. of which is payable in francs).
Double room, each person	£20 10s. (£8 of which is payable in francs).

Travel to Paris and Superior 2nd Class Hotel.

Single room	£20 1s. 6d. (£8 of which is payable in francs).
Double room, each person	£18 18s. 6d. (£6 10s. of which is payable in francs).

These prices are for second class rail and first-class boat travel, bed and plain breakfast at hotel, meals en route, all gratuities, and the services of a courier. The supplement for first-class travel throughout is £1 18s. 6d.

Members are advised to take soap with them, as some hotels do not provide this.

Dress.—Evening dress, *with decorations*, will be required for the Banquet.

Correspondence.—Members' correspondence may be addressed c/o The Institute of Metals' Meeting Office, Chez Maison de la Chimie, 28 rue St. Dominique, Paris, 7e, France.

Presentation of Papers and Subsequent Discussion.—Members are requested particularly to note that in order to provide as much time as possible for discussion:

(1) Authors will be allowed a *maximum* of 5 minutes in which to introduce themselves to the meeting and to emphasize points on which they would particularly welcome discussion; it will be assumed that those present have read the papers to be presented.

(2) Authors will be allowed *not less* than 10 minutes in which to reply to discussions.

(3) Members intending to take part in the discussions are requested to state their intention to do so, as early as possible,

NEWS AND ANNOUNCEMENTS

and whether they desire to show lantern slides. To obviate delays, those who have slides to show should hand them to the lantern operator, or to a member of the Institute's staff, at the commencement of the session.

Visits to Works, Laboratories, &c.—Brief descriptions of works and laboratories to be visited during Part I of the meeting are given in the separate programme which has already been distributed to members; duplicate copies may be obtained on application to the Secretary.

Acknowledgement.—Acknowledgement is made to the Commissariat au Tourisme for permission to publish the photographs of Paris.

OFFICIAL VISIT TO THE ENGINEERING AND MARINE EXHIBITION, LONDON, 25 AUG. TO 10 SEPT. 1949

The Institute will pay an official visit to this exhibition on Thursday, 1 September. Members will have received a ticket of admission for two persons.

ANNUAL SUBSCRIPTIONS

Members are reminded that their annual subscriptions for the year 1949-50 became due on 1 July, and, if not already sent, should be paid to the Secretary without delay.

As the payment of subscriptions by Bankers' Order is both convenient to the members and saves postage and much administrative work on the part of the staff, those members who have not done so are urged to complete a Bankers' Order now, obtaining a copy of the necessary printed form from the Secretary.

MEMBERSHIP DEVELOPMENT

As its financial year commences on 1 July, this is a particularly good time at which to join the Institute. Members are reminded that the President has made a special appeal to all members to bring about a very large increase in membership during the present year. To facilitate membership development, the payment of an entrance fee has been suspended. There are many who now subscribe regularly to the Institute's publications as non-members (including librarians) who could benefit by becoming members of the Institute.

Forms of application for membership may be obtained from the Secretary; copies will be found in the 1948 List of Members.

JOURNAL: SPECIAL ISSUES

Two special issues of the *Journal* and *Metallurgical Abstracts* were published in July and were despatched to all members who had paid the annual subscription for the financial year 1947-48. The issues are (1) the Proceedings and Index number of the *Journal*, 1948, vol. 74, part 13, and (2) the Title Page, Contents, and Name and Subject Index number of *Metallurgical Abstracts*, 1948, vol. 15. These two issues complete the 1948 volumes.

Binding cases for these books (*Journal*, 1948, vol. 74, and *Metallurgical Abstracts*, 1948, vol. 15) are now being prepared. Copies will be sent (free) to all members and subscribers who apply for them and who paid the subscriptions for the year concerned.

PERSONALITIES

MEMBERS OF THE FRENCH MEETING RECEPTION COMMITTEE

Général P. Nicolau

Ingénieur Général Pierre Nicolau, the President of the Société Française de Métallurgie, who is Chairman of the Paris Meeting Reception Committee, is Director of the Laboratoire Central et des Ecoles de l'Armement, and President of the Comité de Direction de l'Institut Supérieur des Matériaux et de la Construction Mécanique. He is an Officier de la Légion d'Honneur, and was awarded the Croix de Guerre in the 1914-18 war.

For 30 years Général Nicolau has been connected with the well known laboratories of St. Thomas d'Aquin, of which he has been Director since 1939. He has specialized in physico-chemical and mechanical studies of metallic materials, the control of raw materials and manufactured products, the technique of interchangeability, standardization, and industrial metrology. He has published over a hundred papers on these subjects; has evolved new methods and devised several original pieces of apparatus to put them into effect, including a thermomagnetic analyser of high sensitivity, the mechanical testing of castings by means of small test-pieces, a pneumatic integrator for surface roughness, machines for recording frequency curves for metrological standards, &c.



Général Nicolau has taken an active part in the development of standardization in France and in the work of several committees of the International Standards Association.

Professor Georges Chaudron

Professor Georges Chaudron, a Chevalier de la Légion d'Honneur, was born on 29 April 1891, and was a pupil of Henri Le Chatelier. He served in the 1914-18 war as an artillery officer, and was awarded the Croix de Guerre. After the war he again studied under Le Chatelier, and obtained the degree of Docteur ès Sciences at the University of Paris in

1921, his thesis being concerned with equilibrium reactions in the blast furnace. He is a doctor *honoris causa* of the University of Brussels, and became a member of the Institute of Metals in 1928.

He was Assistant Director of the Laboratoire de Chimie Minérale at the Collège de France from 1921 to 1928, Professor of Chemistry in the Faculté des Sciences and Director of the Institut de Chimie at Lille from 1928 to 1939, and since 1939 has been Professor in the Faculté des Sciences at Paris and director of the laboratories of the Centre Nationale de la Recherche Scientifique at Vitry, near Paris. As occupant of the chair of applied chemistry at the Sorbonne, he lectures on general metallurgy.

Professor Chaudron's work has been concerned principally with mineral chemistry and metallurgy. He is the author of well known books on light alloys and on the preparation and properties of metals of high purity. In recent years he has interested himself chiefly in the part played by the surface state in the phenomena of corrosion and in the protection of metals. The Vitry laboratories, of which he has been the Director since their formation, have, of course, a great reputation throughout the world.

Professor Chaudron is to deliver the Autumn Lecture to the Institute in Paris on the evening of Monday, 3 October, on "Recent French Work in the Field of Light Alloys".

Professor P. A. J. Chevenard

Professor Pierre Antoine Jean Chevenard, who is an Honorary Member of the Institute of Metals and also Honorary Corresponding Member to the Council for France, was born in 1888 at Thizy. He studied at the Ecole des Mines de Saint-Etienne, from which he graduated top in 1910 and then took up a post as technical secretary at the Decazeville works of the well-known firm of Commentry, Fourchambault et Decazeville, but in the following year he was transferred to the laboratory of their steel works at Imphy. His work on nickel-chromium steels was so remarkable that a little over a year after he had entered the laboratory the Director-General of the firm created a new post for him, that of "engineer-in-charge of metallographic research at Imphy", and his job was, in addition to solving the problems in manufacture and the needs of customers, "methodically to study special steels so as to discover and exploit their unusual properties".

In the course of this study, the results of which are well known to all interested in special steels, M. Chevenard designed and made the very large range of instruments which will always be associated with his name, including a dilatometer in which the principle of the "optical tripod" was employed, thermomagnetometers, thermostats, machines for testing the mechanical properties of specimens which had a volume of only 1/1000 of the standard test-bars, and many others.

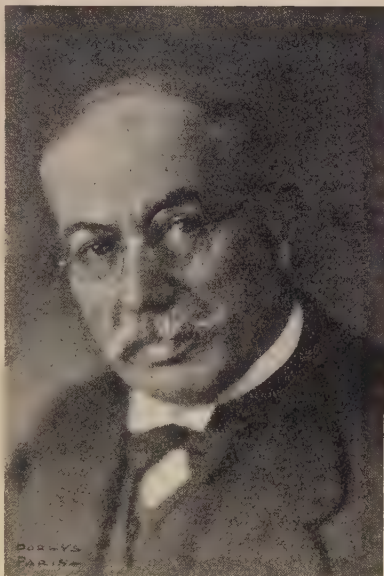
With these instruments M. Chevenard investigated the effects of the transformations in a very large number of special steels, more especially nickel-steels with or without additions of chromium, tungsten, cobalt, copper, and other elements, over a range of temperature between -195° and 900° C. He further studied the effect of heat-treating these steels on their resistance to stress-corrosion, both in liquids and gases, and also on their fatigue

properties. This work led in the first place to an improvement in the products of the Imphy works and later to the development of new materials, including a heat-resisting alloy for use in the manufacture of ammonia under a pressure of 1000 atm. at 600° C., and an alloy for the blades of steam turbines.

Another application of his work lay in the field of horology, where he introduced a variation of Elinvar for use in the balance-wheel springs of chronometers.

In addition to his research work, M. Chevenard took an active part in teaching. He was Professor at the Ecole des Mines at Saint-Etienne, where he had been a student, from 1919 to 1935, and also at the Ecole Supérieure de Fonderie from 1923 to 1939. At present he is conducting a metallography course at the Ecole des Mines de Paris. Furthermore, he instituted courses in the works of his firm for apprentices, workmen, &c.

M. Chevenard, who is a Membre de l'Institut de France, has been the recipient of many honours. On three occasions he was awarded a prize of the Académie des Sciences (1924, 1935, and 1943). He is lauréat of the Société des Ingénieurs civils de France; of the Société d'Encouragement; of the Société française de Navigation aérienne; and of the Centre national de la Recherche scientifique. He is a Past-President of the Société française de Physique, the Association technique de Fonderie, and the Société française de Métallurgie, and a Vice-President of the Société de l'Industrie Minérale. In 1946 he was elected member of the Académie des Sciences, and in 1947 a doctor *honoris causa* of the University of Liège.



Professor Albert M. Portevin

Professor Albert Marcel Portevin, who was elected an Honorary Member of the Institute of Metals in 1940, was born in Paris on 1 November 1880. He is a Commandeur de la Légion d'Honneur, a Commandeur de l'Ordre de la Couronne de chêne de Luxembourg, and a Membre de l'Institut de France.

Trained as an engineer, M. Portevin was director of the laboratories of the de Dion-Bouton motor works from 1905 to 1912. From 1912 to 1925 he was first Lecturer and later Professor at the Ecole Centrale des Arts et Manufactures, and was appointed Professor at the Ecole Supérieure de Soudure Autogène, Paris, in 1931. In 1907 he was appointed Secretary-General of the French

periodical *Revue de Métallurgie*, and became the Vice-President of its editorial committee in 1931. He is a member of the board of several metallurgical companies.

Most of Professor Portevin's work has been on physical metallurgy, particularly of steels. He has made special studies of the processes of fusion and solidification and of transformations in the solid state. He extended Tammann's method of thermal analysis to ternary systems, and, with Professor Chevenard, has perfected methods of dilatometric analysis. Together with M. Castro, Professor Portevin carried out important studies of the non-metallic inclusions and of the determination of oxygen in steels, and he has developed micrographic methods for the study of non-ferrous alloys comparable with those used for steels.



In collaboration with Cymboliste, he used the method of brittle lacquers for studying the distribution of stress in metal structures under load. Besides determining the equilibrium diagrams of several alloy systems, he has made an extensive examination of the various types of microstructure and devised means of classifying them systematically. He has carried out extensive work on the transformations of steel and on the light alloys of aluminium. In a series of papers with Bastien, he showed the principles governing the "castability" of alloys, and has also carried out much work on autogeneous welding. The majority of Professor Portevin's papers have

dealt with steels, but much of the work on foundry problems, on corrosion, and on inclusions is equally of importance for non-ferrous alloys.

Professor Portevin has rendered great services to metallurgical education, to the organization of research in France, in the direction of the *Revue de Métallurgie*, and in the formation of the Société Française de Métallurgie. He has maintained close relations with foreign metallurgists, and no French metallurgist is held in higher esteem. Reference might, perhaps, be made to his command of his own language; his addresses—even impromptu—are illustrations of the beauty and clarity of the French language.

In the course of a long and distinguished career, Professor Portevin has been the recipient of many honours. In addition to those mentioned at the commencement of this notice, he is an ingénieur and docteur *honoris causa* of the Universities of Brussels, Cracow, Liège, Pribram, and Zürich. He is a member or corresponding member of the Academies of Barcelona, Madrid, Prague, Stockholm, and Warsaw; Carnegie and Bessemer Medallist of the Iron and Steel Institute; Honorary Member of the American Institute of Mining and Metallurgical Engineers, the Iron and

Steel Institute, and of other scientific societies; Président d'Honneur of the Association Technique de Fonderie and of the Société des Ingénieurs de l'Automobile; President or Past-President of the Société Française de Minéralogie, the Institut de Soudure Autogène, and others, and Vice-President or Past Vice-President of the Institut Internationale de Soudure, Société Chimique de France, Société Française des Mécaniciens, Société d'Encouragement pour l'Industrie Nationale, &c. He is Directeur Technique of the *Revue de Métallurgie* and Directeur honoraire of the Ecole Supérieure de Fonderie.

NEW MEMBER OF COUNCIL

Dr. G. V. Raynor

Dr. Geoffrey Vincent Raynor, who has been elected to fill a casual vacancy on the Council (caused by the resignation, owing to ill-health, of Professor L. Aitchison), was educated at Nottingham High School and Keble College, Oxford, to which he proceeded after the award of the Senior Scholarship of the County of Nottingham.

At Oxford he obtained a First Class in the Honour School of Natural Science (Chemistry) and qualified for the degree of B.Sc. in 1936. From 1936 to 1938 he carried out research work, mainly on the constitution of magnesium alloys, as Research Assistant to Dr. W. Hume-Rothery, F.R.S., in the Inorganic Chemistry Laboratory of Oxford University. As a result of this work he obtained the degree of D.Phil. early in 1939, and received a Department of Scientific and Industrial Research Senior Research Award for further research at Oxford.

He was continuously engaged in metallurgical research at the Inorganic Chemistry Laboratory, where he held the post of Lecturer and Demonstrator in Chemistry until December 1944. The period from 1940 onward was occupied in extra-mural research for the Ministry of Supply and the Ministry of Aircraft Production, mainly in connection with titanium-steels and the constitution of aluminium alloys, in collaboration with Dr. Hume-Rothery.

In 1944, Dr. Raynor was appointed to an Imperial Chemical Industries Research Fellowship in Metallurgy at Birmingham University and took up his duties there, under the general supervision of Professor D. Hanson, D.Sc., in January 1945. He continued with research on problems related to the constitution of alloys, and directed the work of a group of investigators on this subject. He was appointed to a Senior Lectureship in Metal-



lurgy at Birmingham University in March 1947, and to the Readership in Theoretical Metallurgy in the autumn of the same year. He received the Beilby Memorial Award for 1947, and was awarded the degree of D.Sc. of Oxford University in the following year.

Dr. Raynor has published about 65 papers, in collaboration with colleagues and research students, on the theories and properties of alloys in the *Proceedings of the Royal Society*, *Philosophical Magazine*, *Journal of the Institute of Metals*, *Journal of the Iron and Steel Institute*, *Transactions of the Faraday Society*, *Journal of the Royal Aeronautical Society*, the *Journal of Scientific Instruments*, and others, and is the author of "An Introduction to the Electron Theory of Metals" (Institute of Metals Monograph and Research Series No. 4), which is in its second printing, and of seven pamphlets of the Institute of Metals Annotated Equilibrium Diagram Series, on the constitutions of the systems Al-Cu, Al-Mg, Al-Zn, Be-Cu, Cu-Sn, Cu-Zn, and Pb-Sn.

He is an official consultant to the Department of Atomic Energy, and a member of the Metal Physics and Publication Committees of the Institute of Metals; Metal Physics Committee and X-Ray Techniques Sub-Committee of the British Iron and Steel Research Association; the Non-Ferrous Metals Committee of the Inter-Services Metallurgical Research Council, Ministry of Supply; the Committee of the X-Ray Analysis Group of the Institute of Physics; and of other committees. He is a Fellow of the Royal Institute of Chemistry, a Fellow of the Institute of Physics, an Associate of the Institution of Metallurgists, a Fellow of the Royal Society of Arts, and a Member of the Iron and Steel Institute.

In 1943 Dr. Raynor married Emily Jean Brockless, and has two sons. His principal non-scientific interests are rowing (he is a member of several Midland rowing clubs) and rugby football.

PERSONAL NOTES

DR. H. J. AXON has been elected to an I.C.I. Fellowship in Metallurgy at Manchester University, and will take up the appointment in October.

PROFESSOR P. BASTIEN has been nominated as a Chevalier de la Légion d'Honneur.

MR. WILLIAM BRUCE has taken up an appointment with Imperial Chemical Industries (India), Ltd., 18 Strand Rd., Calcutta.

MR. A. T. CHURCHMAN has been awarded the degree of Ph.D. of Birmingham University.

MR. HORACE W. CLARKE has retired from the Presidency of the British Non-Ferrous Metals Federation, a position that he has held since its formation in 1945. He has been succeeded by MR. W. H. HENMAN. Mr. Clarke will, however, remain a Member of Council of the Federation, as a representative of the Cold-Rolled Brass and Copper Association.

DR. MAURICE COOK has been re-elected President of the Institution of Metallurgists, for the year 1949-50. He has also accepted an invitation to become a member of the Inter-Services Metallurgical Research Council.

MR. E. S. CORNWALL was appointed Managing Director and Chief Engineer of the City Electric Light Co., Ltd., Brisbane, Australia, with effect from 1 May 1949.

MR. V. C. FAULKNER has been elected an Honorary Life Member of the Institute of British Foundrymen, in recognition of the important contributions that he has made to the progress of the Institute and of the foundry industry.

DR. W. HUME-ROTHERY has been awarded the Francis J. Clamer Medal by the Franklin Institute of the State of Pennsylvania "in recognition of his brilliant work in scientifically determining and interpreting the structure and behaviour of metallic equilibrium systems". The Francis J. Clamer Medal, a silver medal and certificate, was established in 1943, to be awarded not less than once in five years for meritorious achievement in the field of metallurgy. It will be presented to Dr. Hume-Rothery on 19 October by Richard T. Nalle, President of the Franklin Institute, at traditional ceremonies in Philadelphia, at which time a number of other awards will also be made.

MR. F. L. LAQUE has received the Speller Award of the National Association of Corrosion Engineers (U.S.A.), in recognition of his achievements in the field of corrosion engineering. Mr. LaQue is in charge of the Corrosion Engineering Section, Development and Research Division, International Nickel Co., Inc., New York; he is Past-President of the National Association of Corrosion Engineers.

SIR ANDREW McCANCE has been awarded the E. J. Fox Gold Medal of the Institute of British Foundrymen in recognition of his valuable contributions to the progress of steel founding.

DR. R. MADDIN has been appointed Assistant Professor of Mechanical Engineering at the Johns Hopkins University, Baltimore, Md., U.S.A.

DR. L. MATTEOLI and his wife, who attended the recent Fourth Empire Mining and Metallurgical Congress, visited the Institute's offices in July. Dr. Matteoli was recently appointed Honorary Corresponding Member to the Council for Italy.

DR. R. B. MEARS has received the Whitney Award of the National Association of Corrosion Engineers (U.S.A.), in recognition of his achievements in the field of the science of corrosion. Dr. Mears was also recently elected President of the Association. He is Manager of the Research Laboratory of the Carnegie-Illinois Steel Corporation at Pittsburgh, Pa.

MR. A. J. MURPHY has been appointed to the Chair of Industrial Metallurgy at Birmingham University, which appointment was vacated by Professor Leslie Aitchison, owing to ill-health.

MR. D. P. C. NEAVE has been elected a Member of Council of the British Non-Ferrous Metals Research Association.

MR. J. J. PICK has been awarded the degree of B.Eng. (2nd Class Hons.) of Liverpool University, and is now engaged as a Senior Research Investigator in the Research Laboratories of Goodlass, Wall and Lead Industries, Ltd., 7 Wadsworth Rd., Greenford, Middlesex.

MISS DOROTHY PILE, who recently joined the staff of the Design and Research Centre for the Gold, Silver, and Jewellery Industries, Goldsmiths' Hall, London, E.C.2, has been elected President of the Birmingham Metallurgical Society. Miss Pile is the first woman to hold this office since the Society was formed 46 years ago.

MR. MAO-HWA PO has recently been appointed Manager of the Taiwan Steel Works, National Resources Commission of the Chinese Government, P.O. Box No. 44, Kaohsiung, Taiwan, China.

PROFESSOR ALBERT M. PORTEVIN has been nominated a Commandeur de l'Ordre de la Couronne de chêne de Luxembourg.

MR. ROBERT L. PREECE has been awarded the degree of B.Sc. (Hons.) in Metallurgy of Birmingham University and has taken up an appointment with the Research Department of Imperial Chemical Industries, Ltd., Metals Division, Witton, Birmingham.

MR. J. G. RITCHIE is Chairman of the Physical Metallurgy Division of the Melbourne Branch of the Australian Institute of Metals for 1949.

MR. L. ROTHERHAM has been nominated to succeed Mr. G. L. Bailey as an Honorary Member of Council of the Institute, representing the Institution of Metallurgists.

MR. A. D. STORKE, C.M.G., relinquished the appointment of Director of the Climax Molybdenum Company of Europe, Ltd., London and Sheffield, as from 30 June.

PROFESSOR L. TAVERNER arrived in England for the Fourth Empire Mining and Metallurgical Congress in July, and plans to attend the Autumn Meeting of the Institute in Paris.

MR. C. R. TOTTLE has been awarded the degree of M.Met. of Sheffield University.

MR. L. G. TOTTLE has been seconded from the Fulmer Research Institute to the Warwick Production Co., to supervise the departments for the electroplating and finishing of aluminium.

MR. A. B. WINTERBOTTOM recently paid a short visit to England in connection with an educational tour of works for the graduate class of metallurgical students from the Technical University of Norway.

DR. W. A. WOOD is Acting Research Professor of Metallurgy in the University of Melbourne during the absence abroad of Professor J. Neill Greenwood.

DEATHS

The Editor regrets to announce the deaths of the following members:

MR. L. F. KEELING, of the Northern Aluminium Co., Ltd., Banbury, Oxon, on 27 May 1949.

MR. GUSTAV LENKE, of Metro-Cutanit, Ltd., London, on 23 June 1949.

ELECTION OF ORDINARY MEMBERS AND STUDENT MEMBERS

The following 25 Ordinary Members and 3 Student Members were elected on 24 June 1949 :

Ordinary Members

- ADAM, Erwin Stefan, Mechanical Engineer, S.A. Ad. Saurer, Arbon, Switzerland.
- AGTE, Curt, Dr.Ing., Engineer, Priper C.32, u Podmokel, Czechoslovakia.
- BANYARD, David Ronald, B.Sc., M.Sc., Metallurgist, The British Aluminium Company, Ltd., Salisbury House, London Wall, London, E.C.2.
- BAXTER, J. Martin, Director, P. and W. MacLellan, Ltd., 129 Tron-gate Street, Glasgow.
- BERRY, Joseph Wallace, Joint Managing Director, Birmingham Aluminium Castings (1903) Company, Ltd., Birmid Works, Dartmouth Road, Smethwick, Staffordshire.
- BRANDENBERGER, Professor Ernst, D.Sc.nat., Professor and Head of the Materials Testing Section, Eidgenössische Technische Hochschule, Zürich, Switzerland.
- BRUNT, William, General Manager, Brockhouse Castings, Ltd., Hall Street, Wednesfield, Wolverhampton, Staffordshire.
- BURKE, Joseph E., B.A., Ph.D., Research Associate, Knolls Atomic Power Laboratory, General Electric Company, Schenectady, N.Y., U.S.A.
- CADEN, Robert, Experimental Officer, Metals Laboratory, Engineering Department, H.M. Dockyard, Devonport.
- CHIPPINDALL, Giles Tatlock, Director-General, Posts and Telegraphs, Postmaster-General's Department, Melbourne C.2, Vic., Australia.
- CONWAY, Cyril Gordon, B.Sc., Consulting Engineer, Power Jets (Research and Development), Ltd., 25 Green Street, London, W.1.
- DARDEL, Yves Marie Pierre, Engineer, Centre de Documentation Sidérurgique, 12 rue de Madrid, Paris 8e, France.
- FISHER, George A., B.Sc., Metallurgical Engineer and Manager, International Nickel Company, Inc., St. Louis Technical Section, 810 Ambassador Building, St. Louis 1, Mo., U.S.A.
- FORD, Hugh, D.Sc., Ph.D., University Reader and Assistant Professor in Applied Mechanics, Imperial College of Science and Technology, South Kensington, London, S.W.7.
- HALL, Kenneth, Managing Director, Northern Aluminium Company, Ltd., Wellington House, Lancaster Place, Strand, London, W.C.2.
- HOBBS, John Francis, B.Sc., Technical Officer, Research Department, Imperial Chemical Industries, Ltd., Metals Division, Witton, Birmingham.
- LEPSÖE, Professor Robert, M.Sc., Professor of Metallurgy, Norges Tekniske Høgskole, Trondheim, Norway.
- LOWLES, Kenneth, Foundry Manager, A. Cohen and Company, Ltd., Craigton Industrial Estate, Barfillan Drive, Cardonald, Glasgow.

NEWS AND ANNOUNCEMENTS

- MALAMOD, George, Dipl.Ing., General Manager, Electrode Factory, Buehrle and Company, Oerlikon Machine Tool Works, Zürich, Switzerland.
- MASON, Noel Henry, Principal Scientific Officer, Ministry of Supply (Air), Research and Development of Materials Branch, Thames House, London, S.W.1.
- DE RHAM, Claude, Technical Director, S.A. des Câbleries et Tréfileries, Cossonay-Gare, Switzerland.
- SALTER, John, B.Sc., Assistant Production Manager, The British Aluminium Company, Ltd., Salisbury House, London Wall, London, E.C.2.
- SHENTON, Edward Bertram, Research Chemist, Incandescent Heat Company, Ltd., Cornwall Road, Smethwick, Staffordshire.
- SCHÜTZ, Konrad Edwin, Foundry Engineer, Oederlin and Company, Ltd., Baden, Switzerland.
- SIMS, Robert, B.Sc., Metallurgist, The British Aluminium Company, Ltd., Bank Quay Works, Warrington, Lancashire.

Student Members

- MACKENZIE, (Miss) Margaret, Student of Metallurgy, King's College, University of Durham, Newcastle-on-Tyne.
- UTTERIDGE, William Ronald, Student of Metallurgy, Coventry Technical College, Coventry.
- WHITE, Douglas, Student of Metallurgy, Coventry Technical College, Coventry.

NEWS OF LOCAL SECTIONS AND ASSOCIATED SOCIETIES

BIRMINGHAM LOCAL SECTION

The address of the Honorary Secretary of the Local Section, MR. E. H. BUCKNALL, M.Sc., has been changed to Ardarroch, 264 Harborne Park Road, Harborne, Birmingham 17.

OTHER NEWS

IRON AND STEEL INSTITUTE : DISCUSSION ON THE CORROSION OF STEEL, LONDON, 18 OCTOBER 1949

A meeting at which a number of papers on various aspects of the corrosion of steel will be discussed will be held at 4 Grosvenor Gardens, London, S.W.1, on Tuesday, 18 October 1949. The meeting will be held from 10.30 a.m. to 1.0 p.m., and 2.0 p.m. to 4.30 p.m. A buffet lunch (price 5s.) will be served in the Joint Library. Further details of the meeting may be obtained from the Secretary, Iron and Steel Institute, 4 Grosvenor Gardens, London, S.W.1.

INSTITUTION OF ELECTRICAL ENGINEERS : SYMPOSIUM ON FERROMAGNETIC MATERIALS

A Symposium on Ferromagnetic Materials, organized by the Measurements Section of the Institution of Electrical Engineers, will be held in the Hall of the Institution, Savoy Place, Victoria

Embankment, London, W.C.2, on Monday and Tuesday, 7 and 8 November 1949. The Symposium will comprise four sessions, at each of which one or more main papers will be read, with the presentation in summary form of a number of short related papers. The sessions will take place from 2.30 to 4.30 p.m. and from 5.30 to 8.0 p.m. on each day.

Members of the Institute of Metals are invited to attend this Symposium and to take part in the discussions on the papers. Proofs of the main papers and of the short related papers not yet published in the *Proceedings* of the Institution will be available in advance, and suitable summaries of the short related papers that have already been published will also be provided. Copies may be obtained by any members of the Institute of Metals who desire to attend the Symposium, on application to the Secretary.

ELECTROCHEMICAL SOCIETY : 1949 CONVENTION

The 96th Convention of the Electrochemical Society will be held at the La Salle Hotel, Chicago, Ill., U.S.A., on 12, 13, 14, and 15 October 1949. Symposia are being organized on electro-deposition, corrosion, and organic electrochemistry, and special round-table sessions are to be arranged on batteries and on organic electrochemistry.

Further particulars may be obtained from the Secretary, Electrochemical Society, 235 West 102nd St., New York 25, N.Y., U.S.A.

COLLOQUIUM ON PLASTICITY

A Colloquium on Plasticity was held at the University of Melbourne on 24 and 25 May 1949. The Chair was taken at the various sessions by Associate-Professor E. J. C. Rennie, Dr. W. Boas, Professor K. E. Bullen, and Professor A. V. Stephens. It was to have been led by Sir Geoffrey Taylor, F.R.S., who was visiting Australia on the invitation of the National University, but unfortunately, just before the Colloquium, Sir Geoffrey was involved in a motor car accident and was unable to take part in the lively discussions which ensued.

The following papers were presented : F. S. Shaw, "Numerical Solutions of Elasto-Plastic Problems" ; Elizabeth Mann, "Elastic Theory of Dislocations" ; F. László, "Dislocations and Hardness" ; W. A. Wood, "Recent New Observations on the Plastic Deformation of Metals" ; G. R. Wilms, "Some Results on Deformation by Creep" ; W. A. Rachinger, "Crystallite Theory of the Hardness of Metals" ; R. I. Garrod, "Internal Stresses Due to Plastic Deformation" ; K. E. Bullen, "The Interior of the Earth" ; R. E. Aitchison, "Deformation of Ionic Solids" ; W. Boas, "Inhomogeneity of Deformation of the Crystals of an Aggregate" ; L. M. Clarebrough, "Plastic Deformation of Two-Phase Alloys" ; A. S. Moodie, "Stability of Beilby Layers" ; F. Balint, "Propagation of Strains in a Plastic Medium ; in Particular, Shear Strains" ; and F. László, "Strain-Hardening".

AUSTRALIAN INSTITUTE OF METALS

The Second Annual Federal Congress of the Australian Institute of Metals was held at Newcastle, N.S.W., from 30 May to 3 June 1949. The programme included an address by the retiring Federal President, Mr. D. Clark, F.I.M., and a paper by

NEWS AND ANNOUNCEMENTS

Dr. F. Adcock, M.B.E., F.I.M., on "Some Aspects of Metallurgical Research at High Temperatures". (Dr. Adcock was appointed last year as Chief Research Officer of the Broken Hill Proprietary Co., Ltd.) Some interesting visits and some most enjoyable social functions were organized by the Newcastle members.

The Federal Office-Bearers for the year 1949-50 are: President: E. J. Raymond; Vice-Presidents: A. E. Gerrard and J. A. Stewart; Honorary Secretary: R. S. Russell; Honorary Treasurer: E. B. Richardson.

SPECTROCHIMICA ACTA

The publication of this journal was revived after the war, as previously announced in these columns. The third volume will be completed by the appearance of parts 5 and 6 together, during the present month. A new agreement has now been reached by the original publishers, the editors, and a new company—Messrs. Butterworth-Springer, Ltd. This is a joint enterprise of Butterworth & Co. (Publishers), Ltd., and the Springer-Verlag, which will undertake publication as from Vol. IV, which will be issued in London this winter. One of the editors, Mr. E. van Someren, will assume the main editorial responsibility, and MSS. may be sent to him at 4 Churchfields, Broxbourne, Herts.

The multi-lingual character of the periodical will remain unchanged, and the publishers hope to provide speedy publication for papers of spectrochemical interest, whether in the field of emission or absorption spectroscopy.

APPOINTMENTS VACANT

To conform to the requirements of the Control of Engagements Order, 1947, these advertisements are published for the information only of those who are "excepted persons" under the Order.

APPLICATIONS are invited by the Ministry of Supply for the following appointments in the Division of Atomic Energy (Production) at Springfield Factory, Salwick, Preston, Lancs. **EXPERIMENTAL AND ASSISTANT EXPERIMENTAL OFFICERS** to carry out experimental work arising from the Metallurgical Development involved in the production of Atomic Energy. Candidates must at least possess Higher School Certificate or have passed inter B.Sc., and preferably have some knowledge of metallurgical methods of investigation. Salary for Experimental Officers (Male), who must be at least 28 years old, will be assessed according to qualification and experience within the range £495-£645 p.a., and Assistant Experimental Officers (Male), according to age, within the range £220-£460 p.a. Rates for women are slightly lower. Applications should be addressed to Staff Section, Ministry of Supply, Division of Atomic Energy (Production), Risley, nr. Warrington.

APPLICATIONS are invited from **METALLURGISTS** with some years' experience in industry for a post in the Technical Department of a firm of Non-Ferrous Metal Manufacturers in the Slough area. Duties involve the investigation of metallurgical problems associated with present production, as well as more fundamental research on new products and methods of manufacture, and will include supervision of the application in the production departments of such new developments as result. A sound scientific background is essential, and applicants will be preferred who have had experience of actual production as well as of research work. Age, about 30 or over. Salary, £600 p.a. upwards. Reply to Box No. 278, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

ASSISTANT METALLURGISTS (2), age 25-30, required by firm with modern works in South Wales, for control and development work in the fabrication of aluminium and aluminium alloys. Previous works' experience an advantage. Reply, stating age, qualifications, and experience, to Box No. 276, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

NEWS AND ANNOUNCEMENTS

BRITISH NON-FERROUS METALS RESEARCH ASSOCIATION invites applications for the following posts: (a) Chemist or Metallurgist to study the marine corrosion of non-ferrous metals. (b) Metallurgist to investigate general problems in physical metallurgy such as phase equilibria. Candidates should possess a good degree in chemistry or metallurgy. Prior research experience is desirable, but this need not necessarily be in the same field. Commencing salary up to £750 per annum, according to qualifications and experience. Apply to The Secretary, British Non-Ferrous Metals Research Association, 81-91, Euston Street, London, N.W.1.

ENGLISH ELECTRIC require experienced Senior Research Metallurgist for work in their Laboratories at Stafford. Apply, quoting Ref. 244 and stating salary required, to Central Personnel Service, English Electric Co., Ltd., 24-30 Gillingham Street, Westminster, London, S.W.1.

METALLURGIST required as Assistant in Laboratory attached to large non-ferrous foundries in S.E. London. Preference will be given to applicants with good degree or equivalent qualifications, and with experience in copper-base alloys. Please write, giving full details of qualifications, experience, and salary required, to Box No. 274, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

METALLURGIST required for responsible post in Sheffield steelworks. Degree standard or equivalent, and experience in practical steelworks' problems with particular reference to special and alloy steels. State age, experience, and salary required to Box No. 277, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

RADIOLOGIST required to take charge of X-ray laboratory. Experience of light alloy radiography to A.I.D. requirements essential. Write, stating age, qualifications, career to date, and commencing salary desired, to the Director of Research and Development, John Dale, Ltd., Brunswick Park Road, New Southgate, London, N.11.

SENIOR METALLURGIST required by firm with modern works recently established in South Wales. Preference will be given to candidates with a University degree and practical experience in the wrought aluminium industry. Age 30-40; commencing salary approximately £800 p.a. Reply, stating age, qualifications, and experience, to Box No. 275, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

SPECTROGRAPHER required by Manchester Research Laboratory. Candidates must have industrial experience and a sound theoretical knowledge. Applications stating details of age, education, training, qualifications, and experience to Secretary, Magnesium Elektron Ltd., Clifton Junction, nr. Manchester.

TECHNICAL LIBRARIAN required; previous experience in abstracting and indexing technical literature essential. Permanent post. Salary according to qualifications. Apply by letter only, stating age and full particulars of experience to Secretary, Copper Development Association, Kendall's Hall, Radlett, Herts.

THE BRISTOL AEROPLANE COMPANY, LIMITED, have vacancies for: (a) **METALLURGIST**, having previous industrial experience in the technical control of heat-treatment, plating, anodizing, and metal treatment processes; (b) **GRADUATE METALLURGIST** as general assistant to the above; (c) **TWO GRADUATE CHEMISTS**, one for analytical inorganic work, and one for development work on electrodeposition. Reply stating age, qualifications, and previous experience to the Staff & Labour Manager, Aircraft Division, Filton House, Bristol.

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